3033-00481

HUNTERS POINT SHIPYARD
PARCEL B
FINAL RECORD OF DECISION

October 7, 1997

Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act)

Department of the Navy
Engineering Field Activity West
San Bruno, California 94066-2402

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Issued by

U.S. DEPARTMENT OF THE NAVY
Engineering Field Activity West
Naval Facilities Engineering Command
San Bruno, California

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1.0 DECLARATION

1.1 SITE NAME AND LOCATION

This record of decision (ROD) is for Hunters Point Shipyard (HPS), Parcel B, in San Francisco, California. HPS was deactivated and placed on industrial reserve in 1974. In 1989, HPS was placed on the National Priorities List (NPL). In 1991, HPS was selected and approved for closure under the Base Realignment and Closure (BRAC) Program.

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Installation Restoration Program (IRP) sites located on Parcel B at HPS in San Francisco, California. The remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, and the National Contingency Plan (NCP).

The decision is based on the administrative record for Parcel B at HPS.

The U.S. Environmental Protection Agency (EPA) and the State of California concur on the selected remedy.

1.3 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Parcel B, if not addressed by implementing the response action selected in this ROD, may present a potential threat to public health, welfare, or the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

This ROD addresses both soil and groundwater contamination for CERCLA hazardous substances at HPS Parcel B. Remediation of areas in which CERCLA hazardous substances are commingled with petroleum hydrocarbons is also addressed by this ROD. Areas containing only petroleum hydrocarbons, which are not hazardous substances as defined by CERCLA, will be addressed in a separate corrective action plan (CAP) under the oversight of the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. The Navy's goal is to coordinate cleanup of CERCLA and non-CERCLA hazardous substances to facilitate property transfer under BRAC.

The Navy has selected excavation and off-site disposal as the final remedy for Parcel B soil. The major components of the selected remedy for soil are as follows:

- Excavation of contaminated soil to the groundwater table or 10^{-6} cancer risk (residential)
- Off-site disposal of contaminated soil (the soil will be treated at the off-site landfill if necessary to meet land disposal restrictions)
- Placement of clean backfill in the excavated areas
- Deed notification indicating that soil below the groundwater table in remediated areas, as specified in the remedial action close-out report, may be contaminated. All future soils excavated from below the groundwater table in remediated areas must be managed in accordance with federal, State and local laws and requirements including local ordinances such as Articles 4.1 and 20 of the San Francisco Public Works Code. In addition, any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals presented in Table 8 of this ROD will be restricted from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone.

The major components of the selected remedy for groundwater are as follows:

- Lining of the storm drains and pressure grouting of the storm drain bedding material at IRP sites IR-07 and IR-10 in those locations where the storm drain system is below the groundwater table in an affected groundwater area
- Removal of steam and fuel lines
- Deed restrictions on Parcel B such as prohibiting all uses of groundwater within the shallow water-bearing zone(s) to 90 feet below ground surface, and notification of the lining of the storm drains are detailed in the selected remedy section of this ROD
- Deed notification indicating that contamination may be present in the groundwater in the remediated areas as specified in the remedial action close-out report. Surface discharge of contaminated groundwater is prohibited.
- Groundwater monitoring for up to 30 years to evaluate the effectiveness of the soil source removal actions and to monitor concentrations of hazardous substances that may

migrate toward San Francisco Bay. Groundwater monitoring at IR-10 to monitor the future potential degradation of trichloroethene (TCE) to vinyl chloride.

The groundwater monitoring program will be developed during remedial design (RD). After 5 years of monitoring, the entire groundwater monitoring program, including the analyses conducted, the frequency of sampling, and the overall duration of the monitoring program, will be re-evaluated as part of the 5-year review as required under CERCLA. Should the Navy wish to terminate the monitoring program, such modification would have to be justified and would likely result in the amendment of this ROD. The Navy shall monitor the groundwater to ensure that the national ambient water quality criteria (NAWQC) as set forth in the Central Valley RWQCB's 1995 Compilation of Water Quality Goals or state water quality objectives as set forth in the 1995 Water Quality Control Plan for the San Francisco Bay Region (the Basin Plan) and the ambient concentration of metals, whichever is higher, are not exceeded at the high tide line of the Parcel B tidally influenced zone, which is the point of compliance. A groundwater monitoring plan that uses a 5-year buffer zone upgradient of the tidally influenced zone will be instituted. A series of sentinel wells will be located upgradient from the point of compliance a distance equivalent to a groundwater travel time of 5 years. The groundwater monitoring data from these sentinel wells will be compared to 10 times NAWQC and the ambient concentrations of metals. If groundwater monitoring indicates that concentrations of hazardous substances exceed these criteria, the Navy will undertake the following actions:

- Orally notify EPA, California EPA Department of Toxic Substances Control (Cal/EPA-DTSC), and the RWQCB (the signatory agencies) within 15 days of any exceedance of the groundwater monitoring criteria followed by a written notice to the signatory agencies within 15 days of the oral notification
- Consult with the signatory agencies regarding the exceedance
- Conduct monitoring to verify the exceedance in accordance with the monitoring plan (which will be developed during the remedial design/remedial action phase)
- At the written request of one or more of the signatory agencies, develop a proposal for their review and comment as to what should be done to address the exceedance, which may result in a change in the remedy

The Navy recognizes that a change to the groundwater remedy may require a ROD amendment. Any changes will be developed and presented to the public and implemented in accordance with the

requirements of CERCLA. The FFA shall continue to apply through operation and maintenance (O&M) of the Parcel B response action.

During the RD phase, the Navy will develop a groundwater model to calculate a site-specific multiplier to be applied to the NAWQC/Basin Plan water quality objectives and ambient metal concentrations to reflect the expected dilution attenuation that is likely to occur as contamination migrates from the monitoring well to the Bay. Once these site-specific criteria are developed and approved by the signatory agencies, the Navy will replace the 10 times default criteria as the trigger for taking the actions listed above.

1.5 STATUTORY DETERMINATIONS

The selected remedy for soil and groundwater is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions to the maximum extent practicable for this site. However, it does not satisfy the statutory preference for remedies that employ treatment to reduce toxicity, mobility, and volume as a principal element. This is due to numerous comments received during the public comment period voicing strong opposition to on-site treatment and disposal, the alternative initially proposed by the Navy for the Parcel B contaminated soils. In response to community concerns, the Navy has selected excavation and off-site disposal for the Parcel B contaminated soils.

Because the remedy may result in hazardous substances remaining in soil and groundwater at concentrations above risk-based levels, the 5-year review under CERCLA Section 121(c) will apply to this action.

Michael McClelland
BRAC Environmental Coordinator
Hunters Point Shipyard

October 9, 1997
Date

Daniel Opalski
Chief
Federal Facilities Cleanup Branch
U.S. Environmental Protection Agency Region IX

10/9/97
Date

Anthony J. Landis, P.E.
Chief
Northern California Operations
Office of Military Facilities
California Department of Toxic Substances Control

10-9-97
Date

Loretta Barsamian
Executive Director
California Regional Water Quality Control Board
San Francisco Bay Region

10.9.97
Date

2.0 DECISION SUMMARY

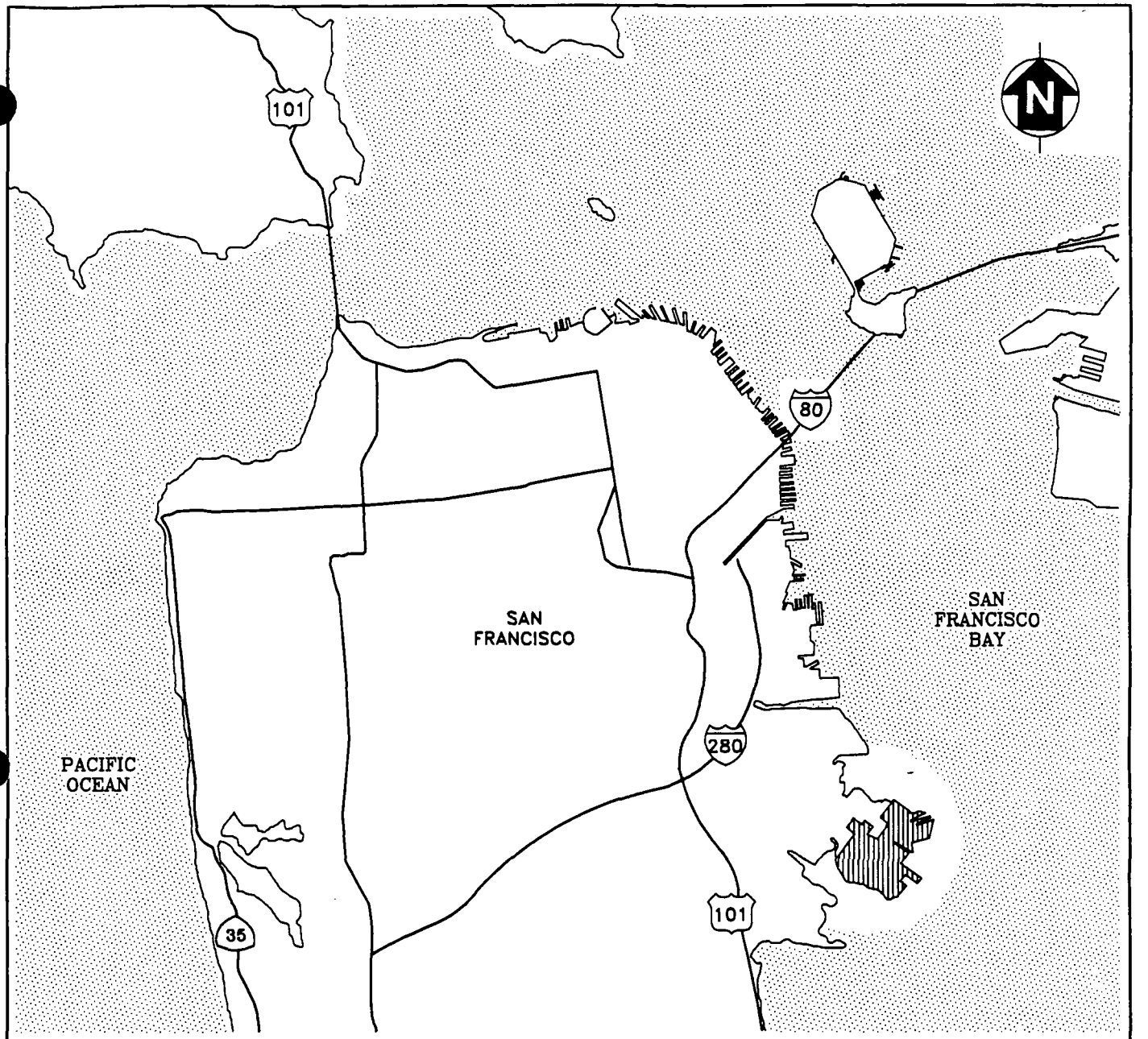
2.1 SITE NAME, LOCATION, AND DESCRIPTION

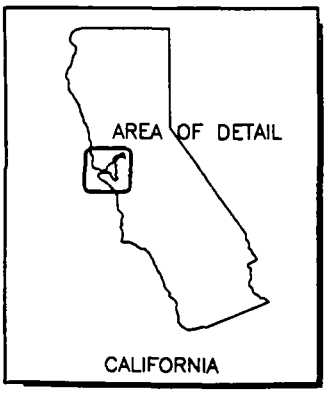
HPS is located on a promontory in southeast San Francisco (Figure 1). The promontory is bounded on the north and east by the San Francisco Bay and on the south and west by the Bayview-Hunters Point district of the City of San Francisco. The entire HPS covers 936 acres: 493 on land and 443 under water. To facilitate the environmental investigation and remediation as well as the ultimate transfer of the property, HPS was divided into several parcels (Parcels A through F) (Figure 2). This ROD addresses the remedy for Parcel B.

Parcel B is bounded by other parcels of HPS (Parcels A and C) to the south, the City of San Francisco Bayview-Hunters Point district to the west, and San Francisco Bay to the north and east. Parcel B covers approximately 63 acres. Historically, Parcel B was used predominantly for office and commercial buildings and light industrial production. Under the local reuse authority's current land use plan, upon transfer of the property by the Navy, Parcel B will be used primarily for an industrial complex, an educational complex, a mixed residential/retail complex, and a cultural/historical district.

Parcel B is located in the lowlands portion of HPS. Ground surface elevations range from 0 to 18 feet above mean sea level.

The peninsula forming HPS is within a northwest-trending belt of Franciscan bedrock. The geology of Parcel B consists primarily of bedrock-derived Artificial Fill. Throughout Parcel B, Industrial Fill and Undifferentiated Upper Sand Deposits occur locally within or beneath the Artificial Fill. Industrial Fill occurs locally in the western portion of Parcel B. In the northern portion of Parcel B, the Artificial Fill in the low-lying areas is generally underlain by Bay Mud Deposits. The Bay Mud Deposits are generally absent in the southern portion of Parcel B next to the 1935 shoreline. In these areas, the Artificial Fill directly overlies bedrock or Undifferentiated Sedimentary Deposits. Undifferentiated Sedimentary Deposits are present locally in some areas at Parcel B, such as in the western areas of the site. The depth





HUNTERS POINT SHIPYARD

1.5 0 1.5 3

SCALE: 1" = 3 MILES

HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

FIGURE 1
FACILITY LOCATION MAP

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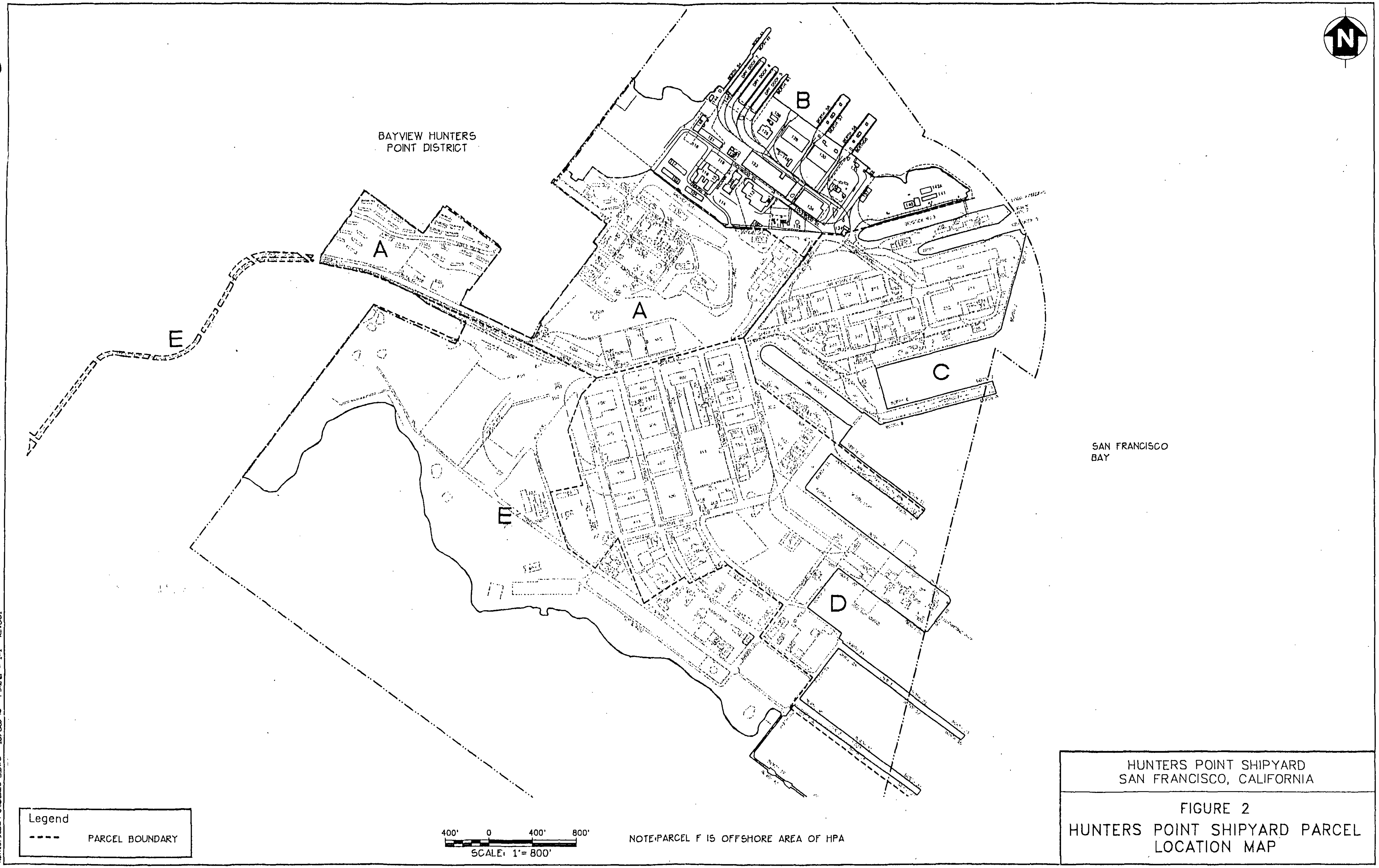


HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

FIGURE 2
HUNTERS POINT SHIPYARD PARCEL LOCATION MAP

to Franciscan Complex Bedrock from the ground surface in Parcel B varies from less than 1 foot in the southern portion of the parcel to greater than 80 feet in the northern portion of the parcel.

No surface waters exist on Parcel B; however, Parcel B is adjacent to San Francisco Bay. Although past information indicated the possible existence of a wetland on Parcel B, reevaluation of that data indicated that no wetlands exist on Parcel B. Two aquifers (the A-aquifer and the B-aquifer) and one water-bearing zone (the bedrock) have been identified at HPS, but only the A-aquifer and the bedrock water-bearing zone are present throughout Parcel B. The B-aquifer is present in limited areas of Parcel B; in other areas, it is indistinguishable from the A-aquifer or is absent.

The A-aquifer consists primarily of saturated Artificial Fill, ranging in thickness from 0 to 90 feet below ground surface (bgs). On Parcel B, A-aquifer groundwater, which ranges from 2 to 15 feet bgs, generally flows to the north and northeast, toward San Francisco Bay. The bedrock water-bearing zone was encountered in the southern portion of Parcel B, and groundwater levels range in depth from 4 to 40 feet bgs.

The Navy and the State agree that neither the A-aquifer nor the bedrock water-bearing zone have been or are likely to be used for drinking water. However, the Navy and State do not agree on whether the groundwater meets the definition of a potential drinking water source under the State Water Resources Control Board (SWRCB) Resolution No. 88-63, "Sources of Drinking Water Policy." That policy excludes from the definition of a potential drinking water source (1) groundwater where the total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) and it is not reasonably expected to supply a public water system, and (2) groundwater that does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day (gpd). It is the Navy's position that neither the A-aquifer nor the bedrock water-bearing zone meet these criteria. The TDS content of the A-aquifer ranges from 443 mg/L to 28,000 mg/L. In isolated areas where the TDS content is below 3,000 mg/L, pump tests indicate that a sustained yield of 200 gpd may be possible; however, any sustained pumping would result in saline bay-water intrusion. TDS levels for groundwater in the bedrock water-bearing zone range from 355 mg/L to 4,540 mg/L. Groundwater in this zone is only present in localized fractures, and a sustained yield of 200 gpd is unlikely. Furthermore, a RWQCB draft staff report concluded that the likelihood that groundwater underlying HPS would be used as a drinking

water source is low (RWQCB 1996). However, the RWQCB maintains that the groundwater in some areas on Parcel B meets the definition of a drinking water source because the TDS is below 3,000 mg/L and some fresh water pumping is possible. Nevertheless, the RWQCB also recognizes that it is highly unlikely that the water would be used for drinking water purposes.

2.2 SITE HISTORY

2.2.1 Installation Development

HPS was first developed for dry dock use in 1867. The Navy acquired title to the land in 1940 and began developing the area for various shipyard activities. In 1942, the Navy began using HPS for shipbuilding, repair, and maintenance. From 1945 to 1974, the shipyard was primarily used as a repair facility by the Navy. The Navy discontinued activities at HPS in 1974, and the shipyard remained relatively unused until 1976. From July 1, 1976, to June 30, 1986, the Navy leased 98 percent of HPS, including all of Parcel B, to the Triple A Machine Shop (Triple A), a private ship repair company; Triple A did not vacate the property until March 1987. In 1986, the Navy reoccupied portions of the property.

The Navy used Parcel B for such purposes as office and commercial buildings, warehousing, fuel storage and distribution, and machining and metal fabrication. Triple A conducted similar activities on Parcel B. Currently, portions of Parcel B are leased for such uses as artists' studios, storage, and cabinet making. Most of Parcel B is covered with concrete or asphalt and buildings.

2.2.2 Environmental Investigations

The Navy began environmental studies at HPS in 1984 under the U.S. Department of Defense's IRP, a program for identifying, investigating, and cleaning up past hazardous waste disposal sites. Between 1984 and 1991, the Navy performed a series of installation-wide investigations, including ambient air monitoring and radiation investigations, to identify potential sources of contamination at HPS. No air or radiation concerns were identified on Parcel B. However, 17 areas on Parcel B have been identified as potential source areas for hazardous substances in soil and/or groundwater. These sites were investigated under CERCLA. A preliminary assessment/site inspection (PA/SI) was conducted at all sites; fifteen of the 17 sites were further investigated in a remedial investigation (RI). The 17 sites on Parcel B are referred to as either SI or IR sites. Sites designated at "SI" sites were investigated through the SI phase at

which stage the Navy, with regulatory agency concurrence, concluded no additional investigations were required on these parcels. For completeness, the two SI sites, SI-31 and SI-45, are discussed in the RI. IR sites were investigated through the RI phase. Table 1 lists the usage of each site by the Navy during the 1940 to 1974 time frame. Figure 3 shows the location of each of these sites.

In 1989, EPA added HPS to the NPL. In 1990, the Navy, EPA Region IX, and the State of California (through the Department of Toxic Substances Control) entered into a FFA to coordinate environmental activities at HPS; in 1992, the FFA was modified and the RWQCB became a signatory to the agreement. In 1991, the U.S. Department of Defense designated HPS for closure as an active military base under its BRAC program.

2.2.3 Removal Actions

The Navy is undertaking removal actions at several sites in Parcel B. At IR-06, the former tank farm, the Navy is excavating approximately 5,400 cubic yards of soil contaminated with organic compounds, metals, and petroleum hydrocarbons and either disposing of the soil off site (approximately 2,600 cubic yards) or treating the soil using bioremediation (approximately 2,800 cubic yards) as part of a treatability study. This removal action has been partially completed, with the exception of excavation of soil in area A-1, which will be remediated to groundwater as part of the remedial action documented by this ROD. The remaining contaminated soil has been removed and confirmation sampling has been performed. Additional groundwater sampling for the A-aquifer and bedrock water-bearing zone will be performed as part of the data gaps sampling for the Parcel B remedial design. The Navy has excavated soil at discrete locations in IR-23 and IR-26 as part of a nontime-critical removal action, referred to as the exploratory excavation (EE) removal action. At IR-23, approximately 854 cubic yards of soil, containing primarily heavy metals, were excavated from three locations (EE-01, EE-02, and EE-03). EE-01 was excavated to a depth of 3 feet bgs; EE-02 was excavated to a depth of 6 feet bgs; a portion of EE-03 was excavated to groundwater depth of 9.5 feet. At IR-26, approximately 817 cubic yards of soil containing solvents, petroleum related compounds, and metals were excavated from two locations (EE-04 and EE-05) to a depth of 7.5 feet. Portions of EE-04 and EE-05 were excavated to groundwater depth (7.5 feet). Confirmation sampling has been performed for the EE removal action. All the EE areas were excavated to remedial action or ambient metals concentrations, with the exception of portions of EE-03 and EE-05. At EE-03, total petroleum hydrocarbons (TPH) as diesel was detected at 1,250 milligrams per kilogram

TABLE 1

PARCEL B SITE DESCRIPTIONS

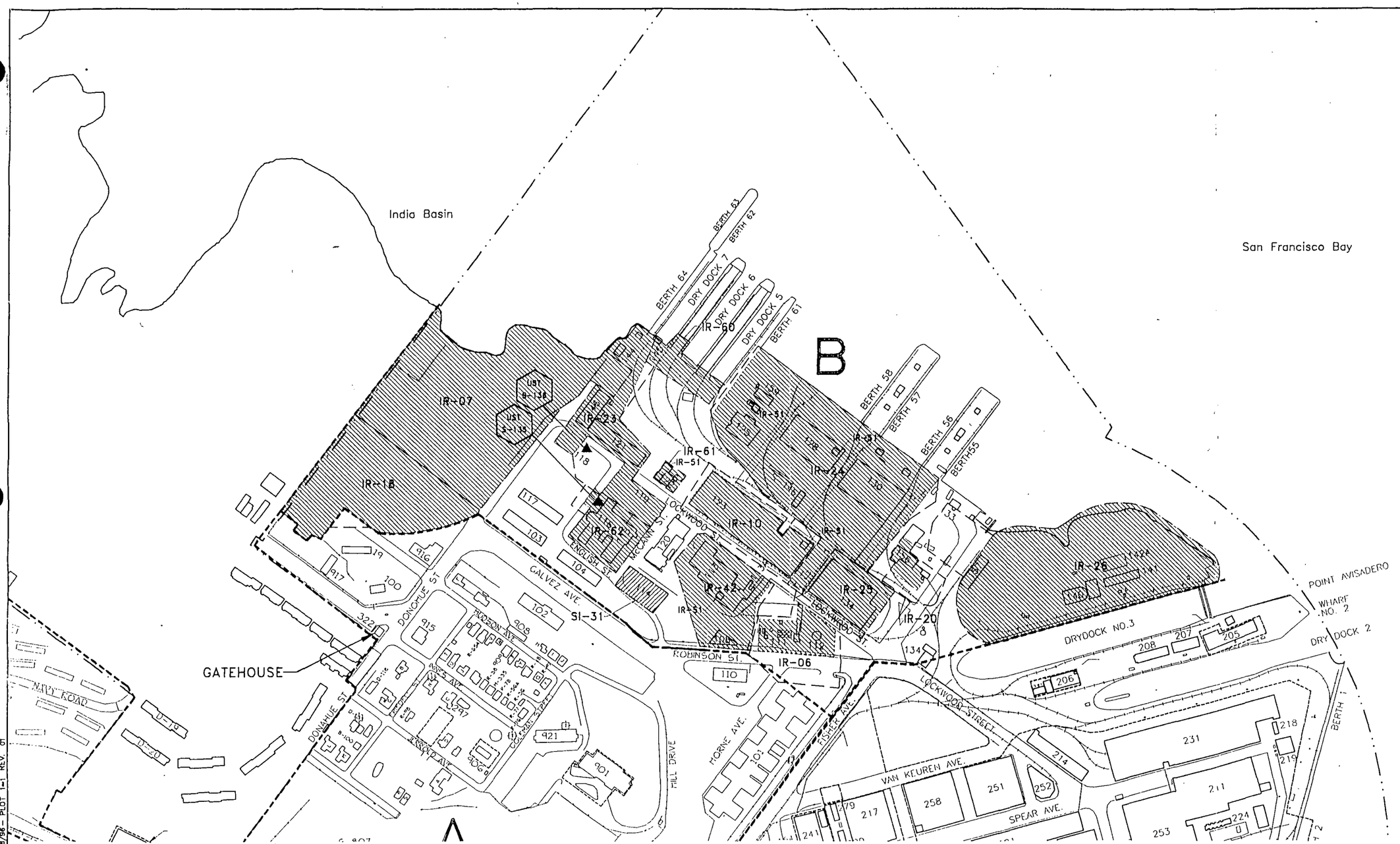
Site Name[a]	Parcel B Site Description
IR-06*	Former Buildings 111 and 112; and Tank Farm
IR-07	Sub-Base Area
IR-10	Building 123, Battery and Electroplating Shop
IR-18	Waste Oil Disposal Area
IR-20	Building 156, Rubber Shop
IR-23*	Building 146, Tactical Air Navigation (TACAN) Facility; Building 161, Maintenance Service; Building 162, Paint Storage; and Tank S-136
IR-24	Building 124, Acid Mixing Plant; Building 125, Submarine Cafeteria; and Buildings 128 and 130, Machine Shop
IR-26*	Building 157, Nondestructive Testing Laboratory; and Area XIV
SI-31	Building 114, Offices
IR-42	Building 109, Police Station; Building 113, Tug Maintenance Shop and Salvage Divers Shop; and Building 113A, Machine Shop, Torpedo Maintenance Shop, Tug Maintenance Shop, and Electrical Substation
SI-45	Steam Line System[b]
IR-46	Fuel Distribution Line and Tank Farm[b]
IR-50*	Storm Drain and Sanitary Sewer Systems[b]
IR-51	Former Transformer Sites[b]
IR-60	Dry Docks 5, 6, and 7
IR-61	Building 122, Electrical Substation V and Compressor Plant
IR-62	Buildings 115 and 116, Submarine Training Buildings and School

Notes:

[a] "IR" refers to sites that were investigated during the remedial investigation. "SI" refers to sites investigated through the site inspection phase

[b] Only utility lines, distribution lines, and transformer sites located within Parcel B were investigated during the Parcel B RI

* IR sites with removal actions in progress or completed



LEGEND

- PARCEL BOUNDARY
- FACILITY BOUNDARY
- IR SITE EXTENDED BOUNDARY FOR RISK ASSESSMENT PURPOSES
- IR SITE BOUNDARY
- SI SITE BOUNDARY
- UST LOCATION

Note:
IR-45, IR-46 AND IR-50 ARE UTILITY SITES AND ARE SHOWN ON UTILITY DRAWINGS 3.1-1.

100 0 100 200
SCALE IN FEET

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY WEST
SAN BRUNO, CALIFORNIA
HUNTERS POINT SHIPYARD — SAN FRANCISCO, CALIFORNIA

Figure 3
Parcel B Map

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(mg/kg) in a confirmation sample at 4.5 feet bgs, beneath the piping connecting to the dispenser of a former aboveground storage tank; this site was not excavated any further due to physical constraints. At EE-05, concentrations for arsenic and mercury (13.8 mg/kg and 6.8 mg/kg) were above remedial action target cleanup levels at 7.5 feet bgs, the depth of groundwater. The contaminated soils were disposed of off site, and the Navy has restored the areas to preexisting surface conditions. The exploratory excavation construction summary report is expected to be completed by the end of 1997 (IT 1997). The Navy has also conducted a nontime-critical removal action that involved removing contaminated sediments in the storm drain system (IR-50). A total of approximately 200 cubic yards were removed from 10,500 linear feet of Parcel B storm drains and were disposed of off site. Those removal actions which left contamination in place, that were above cleanup levels as noted in Table 8 of this ROD above the groundwater table, will be excavated as part of the remedial action for this parcel. The remaining removal actions are consistent with the final remedy for Parcel B. Once the removal actions occurring on Parcel B are complete, appropriate documentation will be included in a future ROD; either a parcel ROD or a base-wide ROD; should one be negotiated.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

In the late 1980s, the Navy formed a technical review committee (TRC) consisting of community members and regulatory agency representatives. The TRC met to discuss environmental issues pertaining to HPS. In 1993, pursuant to the Defense Environmental Restoration Program, Title 10 of the United States Code (U.S.C.) Section 2705(d), the Navy formed a Restoration Advisory Board (RAB), which replaced the TRC. The RAB is composed of members of the community, the Navy, and the regulatory agencies. The RAB meets monthly to discuss environmental progress at HPS.

The draft final RI report for Parcel B was released to the public in June 1996 (PRC 1996a) and the draft final FS report was released in September 1996 (PRC 1996b). The proposed plan for Parcel B was released to the public on October 16, 1996. The RI, the FS, and the proposed plan were made available to the public in the administrative record and in information repositories at the City of San Francisco Main Library and the Anna E. Waden Branch Library. In addition, a fact sheet describing the proposed plan was mailed to the more than 1,100 people on the HPS mailing list. A notice of availability of the proposed plan was published in *The San Francisco Chronicle* on October 24, 1996, and in *The Independent* on October 25, 1996. The public comment period on the proposed plan began on October

24, 1996, and was originally scheduled to end on November 25, 1996. At the request of the community, the 30-day public comment period was extended through December 26, 1996. A notice of the extension of the public comment period was published in *The Independent* on November 26, 1996, and in *The New Bayview* on December 6, 1996.

A public meeting was held on November 13, 1996. At that meeting, representatives of the Navy presented the preferred alternative and were available to answer questions about the plan. A response to comments received at the public meeting and during the public comment period is included in the Responsiveness Summary, Appendix B of this ROD. These community participation activities fulfill the requirements of Section 113(k)(2)(B)(i-v) and Section 117(a)(2) of CERCLA.

2.4 SCOPE AND ROLE OF THE RESPONSE ACTION

HPS is a large federal facility containing several potential source areas. To facilitate the investigation, remediation, and property transfer process under BRAC, sites on HPS have been grouped into Parcels A through F. The Navy, EPA Region IX, and the State of California have signed a ROD for Parcel A; that ROD determined that no action was necessary at Parcel A because the site did not pose a potential threat to human health and the environment. This ROD documents the remedy for Parcel B. Parcel B originally included IR-25; alternatives developed and evaluated in the FS and the preferred alternative in the proposed plan included IR-25. However, due to concerns about the long-term impacts of dense non-aqueous phase liquid (DNAPL) in groundwater at that site, the Parcel B boundaries were re-configured and the Navy is evaluating additional remedial alternatives for IR-25. Thus, IR-25 has been incorporated into Parcel C. As a result, the remedy for IR-25 will be proposed in the proposed plan for Parcel C and selected in the Parcel C ROD. Under the current FFA schedule, the remaining parcels to be addressed by RODs are as follows:

Parcel Designation	Final ROD Approval Date
Parcel C	September 1998
Parcel D	January 1998
Parcel E	October 1998
Parcel F	January 1999

The Navy is also preparing a CAP, with the concurrence of the RWQCB, to address sites contaminated only with petroleum substances. Petroleum substances are not defined as hazardous substances under CERCLA. The Navy's goal is to coordinate the activities for the CERCLA sites and petroleum-only sites to develop a single, coordinated cleanup strategy for Parcel B.

2.5 PARCEL B SITE CHARACTERISTICS

The RI was conducted from 1991 to 1996 to evaluate the nature and extent of contamination on Parcel B and the related potential human health and ecological risks. Over the course of the RI, the Navy collected extensive soil, groundwater, and utility line data at the 17 sites on Parcel B. The following samples were collected:

- 450 surface soil samples from 0 to 2 feet bgs
- 1,300 subsurface soil samples from deeper than 2 feet bgs at more than 330 soil boring locations
- 500 groundwater samples from 93 monitoring wells
- 120 HydroPunch and grab groundwater samples
- 35 water and sediment samples from utility lines

Based on the past site uses at the particular site from which the sample was taken, samples were analyzed for one or a combination of the following: inorganic compounds, pesticides, polychlorinated biphenyls (PCB), semivolatile organic compounds (SVOC), volatile organic compounds (VOC), petroleum-related compounds, and gross radiation.

The compounds most often detected in soil and groundwater were petroleum-related compounds, primarily TPH such as diesel and motor oil, which are not hazardous substances as defined under CERCLA. However, at most sites on Parcel B, petroleum compounds are commingled with CERCLA hazardous substances. Areas of commingled contaminants are addressed in this ROD.

At several sites, inorganic compounds were detected at concentrations above ambient concentrations. Most significantly, at IR-07, referred to as the Sub-Base Area, and IR-18, the Waste Oil Disposal Area, lead was detected in soil samples at concentrations of 5,120 mg/kg and 2,380 mg/kg, respectively.

Nickel was also detected at IR-07. The highest nickel concentration in groundwater was 7.1 mg/L and 3,550 mg/kg in soil.

Organic compounds were detected in soil and groundwater samples at IR-10, the former battery and electroplating shop. A maximum concentration of 980 mg/kg TCE was detected in soil at IR-10. The highest TCE concentration detected in a groundwater sample from IR-10 was 45 micrograms/liter (µg/L). A grab groundwater sample had a TCE concentration of 750 µg/L and vinyl chloride at 5 µg/L, however no additional vinyl chloride has been detected at this site.

Contamination has also been detected outside the HPS boundaries near IR-07 and IR-18. The extent of contamination, as well as the source of the contamination, has not been determined.

Appendix A contains information on the range of hazardous substances detected at each Parcel B site. A comprehensive discussion of the nature and extent of contamination on Parcel B appears in Section 4.0 of the RI report (PRC 1996a). A few minor data gaps have been identified within the Parcel B remedial investigation and field sampling will be collected during the remedial design phase to allow the remedial design to adequately address any required remedial action.

2.6 SUMMARY OF SITE RISKS

As part of the RI (PRC 1996a), the Navy evaluated the potential risks to current and future human receptors from exposure to hazardous substances in soil and groundwater. In addition, the Navy has conducted a qualitative ecological risk assessment. The results of the human health and ecological risk assessments are summarized below and are described in detail in Appendix N of the RI report (PRC 1996a).

2.6.1 Human Health Risk Assessment

The human health risk assessment (HHRA) was performed in accordance with EPA and Cal/EPA-DTSC guidance for conducting risk assessments (EPA 1989; DTSC 1992).

A critical component of the HHRA process is to identify the pathways through which exposure could occur as well as the areas of exposure. Currently, Parcel B is used for light industrial purposes. In the

future, after the property is transferred from Navy possession, it could potentially be used for both industrial and residential purposes. For this reason, the HHRA evaluated exposure pathways for both industrial and residential scenarios. Under the current industrial scenario, the HHRA assumed that workers could be exposed by

- Ingestion of, dermal contact with, and inhalation of hazardous substances in surface soils from 0 to 2 feet bgs
- Inhalation of fugitive dusts containing hazardous substances or inhalation of vapors that have volatilized from soil
- Inhalation of vapors from A-aquifer groundwater entering existing structures

Under the future scenarios, residents and workers could be exposed by:

- Ingestion of, dermal contact with, and inhalation of hazardous substances in soil from 0 to 10 feet bgs
- Ingestion of bedrock water-bearing zone groundwater
- Inhalation of vapors from A-aquifer groundwater entering existing or newly constructed buildings

In addition, the HHRA assumed that future residents could be exposed to chemicals from dermal contact with and inhalation of vapors from the bedrock water-bearing zone groundwater, and from consumption of produce grown in Parcel B soil in quantities up to 94 and 64 pounds annually for adults and children, respectively.

Under the current scenario, risks were calculated only for the five IRP sites where soil is currently exposed. For the future scenarios, risks were evaluated for 12 of the 17 sites on Parcel B, regardless of whether the soil is currently exposed. Risks were not evaluated for SI-31 because, during the SI, the Navy concluded that no contamination was present at this site. The HHRA also did not evaluate risks for SI-45 (steam lines), IR-46 (fuel distribution line and tank farm), IR-50 (storm drains and sanitary sewers), and IR-51 (former transformer sites), all of which are installation-wide sites. Instead, data from samples collected from these utilities and transformer locations were incorporated into the HHRA for the IRP site in which the sample was collected.

For the industrial scenarios, exposures were quantified based on a 0.5-acre exposure area. Under the future residential scenario, the exposures were assessed based on a 2,500-square-foot exposure area, the size of a typical residential lot in San Francisco. Within these exposure areas, potential site-specific soil and groundwater exposure point concentrations that are representative of exposure concentrations to chemicals throughout the exposure area were determined. The potential risks from exposure to site contaminants were then calculated under average exposure and reasonable maximum exposure (RME) cases using conservative assumptions. For example, for the RME case, following EPA guidance, the risk assessment assumed that a resident may be exposed to a chemical 24 hours a day, 365 days a year, for a 30-year period, even though typical exposure to the chemical may be far less.

At HPS Parcel B, the risks and hazards were calculated for each exposure area and discussed in the HHRA for the IRP site in which the exposure area is located or in contact with. The calculated risks are presented as probabilities for carcinogens, and as hazard quotients (HQ) for noncarcinogens. For carcinogens, the risk for an exposure area, referred to as an excess lifetime cancer risk (ELCR), represents the possibility that one additional occurrence of cancer will result from exposure to contamination at that exposure area. A risk of 1 in 1,000,000 (which is expressed as 1×10^{-6}) means that 1 person in a population of 1,000,000 exposed under the same conditions and time period could develop cancer as a result of exposure. The American Cancer Society estimates that 1 out of 3 people normally develops some form of cancer for reasons related to lifestyle, genetics, diet or other factors not related to exposure to hazardous waste site contamination, resulting in a normal average of about 330,000 people in a population of 1,000,000 developing cancer. If the risk caused by living at a site such as Parcel B (in its current condition) is 1 in 1,000,000, the risk of cancer is increased by 1 person and the number of people *potentially* developing cancer over a lifetime is 330,001 instead of 330,000. Under Section 300.430(e) of the NCP, acceptable exposure levels are generally levels that represent a hypothetical excess upper-bound lifetime cancer risk between 10^{-4} and 10^{-6} or less. Section 300.430(e) of the NCP also states that the 10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when applicable or relevant and appropriate requirements (ARAR) are not available or are not sufficiently protective.

For noncarcinogens, the effects of a single contaminant in a single medium is expressed as the HQ, the ratio of a single exposure level (that is, the estimated quantity of the contaminant that an individual would be exposed to under a given pathway) over a specified time period to a reference dose for that

substance derived from a similar exposure period. The segregated hazard index (HI) is the sum of the HQs for multiple substances, or for a single substance over multiple pathways, for a specific target organ. A segregated HI greater than 1.0 indicates the potential for adverse health effects, but does not mean that an adverse health effect is certain. It is a benchmark value indicating a greater probability for a possible adverse effect.

In two instances, ELCRs and HIs were not calculated. Instead, in the first instance, to evaluate the potential volatilization of chemicals of potential concern in A-aquifer groundwater, movement through soil and into indoor air spaces was modeled. The estimated air concentrations were compared to EPA Region IX preliminary remediation goals (PRG) for ambient air (EPA 1995). The PRGs use RME values for a residential scenario to estimate concentrations in environmental media that correspond to an ELCR of 10^{-6} or an HI of 1. Second, potential risks associated with lead were evaluated by comparing Parcel B soil data to either EPA Region IX soil PRGs, under the industrial scenario, or to EPA and DTSC blood-lead concentration model results, under the future residential scenario. Detailed descriptions of the approaches used are provided in Appendix N of the RI report (PRC 1996a).

The HHRA found that the primary risks and hazards associated with HPS Parcel B relate to future industrial or residential exposure through ingestion of and dermal contact with contaminated soils (PRC 1996a). In addition, under the future residential scenario, ingestion of produce grown at the site also contributes to the risks and hazards associated with HPS Parcel B. The range of soil ELCRs and segregated HIs for exposure areas within an IRP site and the soil lead evaluation are presented in Tables 2, 3, and 4 for the current industrial, future industrial, and future residential scenarios, respectively. Figure 4 shows the 2,500-square-foot areas within which the HHRA calculated a potential cancer threat to future residents above 10^{-6} or a segregated noncarcinogenic hazard greater than 1 for soil, based on RME assumptions.

For the reasons set forth in Section 2.1 and in Sections 3.8 and 3.9 of the RI report (PRC 1996a), groundwater contamination is unlikely to pose a threat to human health. Nevertheless, A-aquifer and bedrock water-bearing zone groundwater were evaluated in the HHRA. Specifically, the HHRA assumed

TABLE 2

HUNTERS POINT SHIPYARD PARCEL B
POTENTIAL RISKS UNDER CURRENT INDUSTRIAL EXPOSURE SCENARIO[a]

Site Name	Total ELCR Range[b]		Total Segregated HI Range[c]		COPCs Contributing Significantly to Risk and/or Hazard
	Average	RME	Average	RME	
IR-07	6×10^{-8} to 5×10^{-7}	5×10^{-7} to 4×10^{-6}	< 1	< 1	Aroclor 1260, Beryllium, Benzo(a)pyrene
IR-18	1×10^{-8} to 2×10^{-7}	8×10^{-8} to 2×10^{-6}	< 1	< 1	Benzo(a)pyrene, Benzo(b)fluoranthene
IR-23	6×10^{-8} to 1×10^{-7}	5×10^{-7} to 1×10^{-6}	< 1	< 1	Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene
IR-26	6×10^{-7}	9×10^{-6}	< 1	< 1	Aroclor 1260, Benzo(a)pyrene
IR-62	1×10^{-7}	1×10^{-6}	< 1	< 1	Benzo(a)pyrene, Benzo(b)fluoranthene

Notes:

[a] Under the current scenario, risks were calculated only for exposure to contaminated soils at sites that are currently unpaved.

[b] Range of ELCR for all 0.5 acre exposure areas within or contacting the IR site boundary.

[c] Range of segregated HIs for all 0.5 acre exposure areas within or contacting the IR site boundary.

COPC Chemical of potential concern

ELCR Excess lifetime cancer risk

HI Hazard index

RME Reasonable maximum exposure

TABLE 3

HUNTERS POINT SHIPYARD PARCEL B
POTENTIAL RISKS UNDER FUTURE INDUSTRIAL EXPOSURE SCENARIO

Site Name	Medium	Total ELCR Range		Total Segregated HI Range		Lead ≥1,000 mg/kg[c]	COPCs Contributing Significantly to Risk and/or Hazard
		Average	RME	Average	RME		
IR-06	soil[a]	6×10^{-9} to 2×10^{-5}	4×10^{-8} to 8×10^{-4}	<1	<1	Yes	Aroclor 1260, Arsenic, Benzo(a)pyrene, Benzo(h)fluoranthene, Benzo(k)fluoranthene, Benzene, Beryllium
	groundwater[b]	2×10^{-6} to 3×10^{-5}	2×10^{-5} to 2×10^{-4}	<1 to 4.7	1 to 4.9	N/A	Arsenic, Chromium, Vinyl Chloride
IR-07	soil	3×10^{-11} to 9×10^{-7}	3×10^{-10} to 1×10^{-5}	<1	<1	Yes	Arsenic, Benzo(a)pyrene, Beryllium
	groundwater	1×10^{-6}	8×10^{-6}	4.7	4.9	N/A	Arsenic, Manganese
IR-10	soil	1×10^{-10} to 4×10^{-6}	4×10^{-9} to 2×10^{-5}	<1	<1	No	Arsenic, Benzo(a)pyrene, Beryllium, TCE
IR-18	soil	2×10^{-8} to 2×10^{-6}	2×10^{-7} to 1×10^{-4}	<1	<1 to 1.2	Yes	Aroclor 1260, Benzo(a)pyrene
IR-20	soil	5×10^{-9} to 3×10^{-7}	4×10^{-8} to 5×10^{-6}	<1	<1	No	Arsenic, Benzo(a)pyrene, Beryllium, TCE
IR-23	soil	4×10^{-11} to 1×10^{-6}	3×10^{-10} to 2×10^{-5}	<1	<1	Yes	Aroclor 160, Arsenic, Benzo(a)pyrene, Beryllium
	groundwater	1×10^{-6}	8×10^{-6}	4.7	4.9	N/A	Arsenic, Manganese
IR-24	soil	1×10^{-11} to 4×10^{-6}	1×10^{-10} to 9×10^{-5}	<1	<1	No	Aroclor 1260, Arsenic, Benzo(a)pyrene, TCE
	groundwater	2×10^{-5}	2×10^{-6}	<1	<1	N/A	Arsenic, Chromium

TABLE 3 (Continued)

HUNTERS POINT SHIPYARD PARCEL B
POTENTIAL RISKS UNDER FUTURE INDUSTRIAL EXPOSURE SCENARIO

Site Name	Medium	Total ELCR Range		Total Segregated HI Range		Lead ≥ 1,000 mg/kg[e]	COPCs Contributing Significantly to Risk and/or Hazard
		Average	RME	Average	RME		
IR-26	soil	5×10^{-9} to 6×10^{-6}	4×10^{-8} to 5×10^{-4}	<1	<1 to 2.4	Yes	Arsenic, Benzo(a)pyrene
IR-42	soil	6×10^{-9} to 2×10^{-5}	4×10^{-8} to 8×10^{-4}	<1	<1	No	Aroclor 1260, Arsenic, Benzo(a)pyrene, Beryllium
	groundwater	1×10^{-5} to 2×10^{-5}	8×10^{-5} to 9×10^{-5}	<1	<1 to 1.4	N/A	Arsenic, Chromium, Heptachlor epoxide, Manganese, Vinyl chloride
IR-60	soil	2×10^{-7} to 9×10^{-7}	1×10^{-6} to 9×10^{-6}	<1	<1	No	Arsenic, Benzo(a)pyrene, Beryllium
IR-61	soil	9×10^{-2}	2×10^{-6}	<1	<1	No	Aroclor 1260, Arsenic
IR-62	soil	7×10^{-10} to 5×10^{-7}	8×10^{-9} to 2×10^{-5}	<1	<1	No	Benzo(a)pyrene

Notes:

[a] The soil pathway consists of ingestion of, dermal contact with, and inhalation of soils from 0 to 10 feet below ground surface.
[b] The groundwater pathway consists of ingestion of bedrock water-bearing zone groundwater.
[c] Range of ELCRs for all 0.5-acre exposure areas within or contacting the IR site boundary
[d] Range of segregated HIs for all 0.5-acre exposure areas within or contacting the IR site boundary.
[e] Lead in at least one sample in the data set exceeds 1,000 mg/kg.

COPC Chemical of potential concern
ELCR Excess lifetime cancer risk
HI Hazard index
RME Reasonable maximum exposure

TABLE 4

HUNTERS POINT SHIPYARD PARCEL B
POTENTIAL RISKS UNDER FUTURE RESIDENTIAL EXPOSURE SCENARIO

Site Name	Medium	Total ELCR Range[c]		Total Segregated HI Range[d]		Lead ∃ 221 mg/kg[e]	COPCs Contributing Significantly to Risk and/or Hazard
		Average	RME	Average	RME		
IR-06	soil[a]	4×10^{-9} to 3×10^{-3}	4×10^{-8} to 3×10^{-2}	<1 to 4.1	<1 to 8.5	Yes	Aroclor 1260, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Beryllium, Nickel, Antimony
	groundwater[b]	1×10^{-5} to 2×10^{-4}	8×10^{-5} to 8×10^{-4}	<1 to 7.4	<1 to 19	N/A	Arsenic, Chromium, Vinyl Chloride, Carbon Tetrachloride
IR-07	soil	7×10^{-9} to 4×10^{-5}	3×10^{-8} to 2×10^{-4}	<1 to 2.0	<1 to 9.0	Yes	Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Arsenic, Beryllium, Chrysene, Nickel, Antimony
IR-10	soil	1×10^{-8} to 5×10^{-5}	1×10^{-7} to 7×10^{-4}	<1 to 10	<1 to 38	Yes	Trichloroethene, Beryllium, Arsenic, Benzo(a)pyrene
IR-18	soil	2×10^{-8} to 2×10^{-4}	2×10^{-7} to 3×10^{-3}	<1 to 19	<1 to 85	Yes	Aroclor 1260, Aroclor 1254, Arsenic, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Beryllium, Nickel, Chrysene
IR-20	soil	6×10^{-8} to 2×10^{-5}	3×10^{-7} to 8×10^{-5}	<1 to 1.1	<1 to 3.9	Yes	Aroclor 1260, Nickel, Manganese
IR-23	soil	2×10^{-8} to 2×10^{-5}	8×10^{-8} to 3×10^{-4}	<1 to 2.8	<1 to 8.6	Yes	Aroclor 1260, Arsenic, Benzo(a)pyrene, Beryllium, Tetrachloroethene
	groundwater	7×10^{-6}	4×10^{-5}	22	32	No	Arsenic, Manganese, Nickel
IR-24	soil	7×10^{-10} to 6×10^{-4}	4×10^{-9} to 6×10^{-3}	<1 to 2.9	<1 to 6.9	Yes	Aroclor 1260, Aroclor 1242, Arsenic, Benzo(a)pyrene, Benzo(b)fluorathene, Manganese
	groundwater	1×10^{-5}	8×10^{-5}	<1	1.2	N/A	Arsenic, Manganese

TABLE 4 (Continued)

HUNTERS POINT SHIPYARD PARCEL B
POTENTIAL RISKS UNDER FUTURE RESIDENTIAL EXPOSURE SCENARIO

Site Name	Medium	Total ELCR Range[c]		Total Segregated HI Range[d]		Lead ∃ 221 mg/kg[e]	COPCs Contributing Significantly to Risk and/or Hazard
		Average	RME	Average	RME		
IR-26	soil	6×10^{-8} to 1×10^{-4}	4×10^{-7} to 5×10^{-3}	<1 to 14	<1 to 200	Yes	Arsenic, Aroclor 1260, Beryllium, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Manganese
IR-42	soil	7×10^{-8} to 3×10^{-3}	4×10^{-7} to 3×10^{-2}	<1 to 3.9	<1 to 64	No	Aroclor 1260, Manganese, Nickel
	groundwater	3×10^{-5} to 1×10^{-4}	2×10^{-4} to 7×10^{-4}	<1 to 4.2	1.4 to 9.6	N/A	Arsenic, Chromium, Vinyl Chloride
IR-60	soil	1×10^{-5}	8×10^{-5} to 9×10^{-5}	<1	<1 to 1.7	No	Arsenic, Manganese, Zinc
IR-61	soil	3×10^{-6} to 4×10^{-6}	5×10^{-5} to 7×10^{-5}	<1	<1 to 1.3	No	Aroclor 1260, Arsenic
IR-62	soil	2×10^{-9} to 3×10^{-7}	1×10^{-8} to 3×10^{-6}	<1	<1	No	Bis(2-ethylhexyl)phthalate

Notes:

[a] The soil pathway consists of ingestion of, dermal contact with, and inhalation of soils from 0 to 10 feet below ground surface and ingestion of homegrown produce.
[b] The groundwater pathway consists of ingestion of, dermal contact with, and inhalation of vapors from bedrock water-bearing zone groundwater.
[c] Range of ELCR for all 2,500-ft^2 exposure areas within or contacting the IR site boundary.
[d] Range of segregated HI for all 2,500 ft^2 exposure areas within or contacting the IR site boundary.
[e] Lead in at least one sampling location in the data set exceeds 221 mg/kg.
COPC Chemicals of potential concern
ELCR Excess lifetime cancer risk
HI Hazard index
RME Reasonable maximum exposure

SAN FRANCISCO BAY

IR-07
IR-18
IR-23
IR-60
IR-61
IR-62
IR-24
IR-10
IR-20
IR-26
SI-31
IR-42
IR-06

LEGEND

- IR SITE BOUNDARIES
- PARCEL B BOUNDARY
- POTENTIAL CARCINOGENIC RISK EXCEEDS 1.0E-06 OR TOTAL SEGREGATED HI EXCEEDS 1

250 0 125 250
SCALE IN FEET

DEPARTMENT OF THE NAVY — NAVAL ACTIVITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY WEST
SAN BRUNO, CALIFORNIA
HUNTERS POINT SHIPYARD — SAN FRANCISCO, CALIFORNIA

FIGURE 4
PARCEL B
GRID AREAS IN WHICH POTENTIAL CARCINOGENIC RISK EXCEEDS 1.0E-06 OR TOTAL SEGREGATED HI EXCEEDS 1: FUTURE RESIDENTIAL SCENARIO

10/02/97 — Code: /data3/hunters/amls/parc_b/riskgrid_combo4.map — AML — /data3/hunters/amls/parc_b/riskgrid_combo.aml

that people may ingest, inhale, or come into physical contact with water from the bedrock water-bearing zone. The ranges of ELCRs and segregated HIs for bedrock water-bearing zone exposure areas within each IRP site are presented in Tables 3 and 4 for the future industrial scenario and the future residential scenario, respectively. For A-aquifer groundwater, the only potential pathway is volatilization of chemicals into indoor air. Based on the modeling of A-aquifer groundwater data, groundwater in sites IR-06, IR-10, and IR-24 (in the vicinity of IR-10) indicate a potential threat to future residents in a localized area of Parcel B. However, this risk is likely overestimated based on VOC emission flux rate measurements from the exposure area with the highest A-aquifer groundwater VOC concentrations.

Indoor air concentrations based on the measured emission flux rates were all below ambient air PRGs and were significantly lower than the indoor air concentrations calculated from groundwater VOC concentrations.

2.6.2 Ecological Risk Assessment

Approximately 75 percent of Parcel B is developed and covered by manmade structures such as roads and buildings. With little open space for flora and fauna, Parcel B is considered to have insignificant habitat value. Exposure pathways to terrestrial species are incomplete because of the lack of habitat and predominance of paved areas. As a result, Parcel B does not pose a risk to terrestrial receptors. Concentrations of hazardous substances in groundwater migrating to San Francisco Bay are below NAWQC and water quality objectives (taking into account dilution and ambient metal concentrations), except at IR-07. Compounds exceeding NAWQC at IR-07 include metals such as nickel, and SVOCs; mitigative measures such as source removals and post-remediation groundwater monitoring for four quarters will be implemented to address potential threat to aquatic receptors. Therefore, with the possible exception of IR-07, the groundwater impacted with CERCLA substances does not pose a threat to aquatic receptors. Potential risks to aquatic receptors posed by petroleum substances are being evaluated separately under the Parcel B CAP. However, because sediment in storm drains may pose a threat to aquatic receptors, the storm drains have been cleaned out as part of a removal action, as discussed in Section 2.2.3. Any appropriate response actions to address past releases from Parcel B that may have impacted aquatic receptors will be considered in the Parcel F FS and ROD.

2.7 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

This section discusses ARARs for Parcel B at HPS. Under Section 121(d) of CERCLA, remedial actions that are conducted entirely on site must attain a level or standard of control which complies with ARARs, unless waived. ARARs are federal environmental laws and more stringent state environmental and facility siting laws. In addition to being more stringent than federal requirements, state requirements must also be legally enforceable, consistently enforced statewide, and identified in a timely manner to qualify as ARARs.

Any portion of a remedial action which takes place off site must comply with all laws legally applicable at the time the off-site activity occurs, both administrative and substantive. For example, contaminated soil transported off site must be transported in accordance with applicable Department of Transportation (DOT) regulations, 49 CFR Parts 171-179.

ARARs may be chemical-specific, location-specific, or action-specific. The ARARs identified by the Navy are described below. Also discussed below are several state requirements that the State has asserted are ARARs. The Navy does not agree that all of those requirements are ARARs. The following discussion identifies those areas of disagreement between the Navy and the State.

Chemical-Specific ARARs

Chemical-specific ARARs are health- or risk-based concentration limits, numerical values, or methodologies for various environmental media that are established for a specific chemical that may be present at the site, or that may be discharged to the site during remedial activities. Laws and regulations that have been identified as potential ARARs for the two media of concern at Parcel B, groundwater and soil, are discussed below.

Soil

The Navy has not identified any chemical-specific ARARs for soil at Parcel B. However, the State asserts that SWRCB Resolution No. 92-49 and the Basin Plan are chemical-specific ARARs for soil.

Because Resolution No. 92-49 and the Basin Plan do not contain "health- or risk-based concentration limits, numerical values, or methodologies" for soil, the Navy disagrees with the State.

Groundwater

The State asserts that SWRCB Resolutions 88-63, 92-49, and 68-16 and the Basin Plan are chemical-specific ARARs for groundwater at HPS Parcel B. Each of these documents is discussed below.

Resolution No. 88-63: As explained in Section 2.1, SWRCB Resolution No. 88-63 defines potential sources of drinking water, and this definition is relevant in determining appropriate cleanup goals. The Navy and the State do not agree on whether A-aquifer and bedrock water-bearing zone groundwater meet the criteria for classification as a potential drinking water source. For the reasons set forth in Section 2.1, the Navy has determined that neither the A-aquifer nor the bedrock water-bearing zone meet the criteria in Resolution No. 88-63. While the State believes that the groundwater in both the A-aquifer and the bedrock water-bearing zone technically is potentially suitable for drinking water use, the State also recognizes that use is not likely to be realized. Many extreme conditions of water availability within the San Francisco Bay region would have to change dramatically before the potential use of the water for drinking would be realized. For this reason, the State concurs that, regardless of whether Resolution 88-63 applies to Parcel B groundwater, cleanup of the water to drinking water standards is neither applicable nor relevant and appropriate at HPS Parcel B.

Resolution No. 92-49: SWRCB Resolution No. 92-49, adopted pursuant to the Porter-Cologne Water Quality Act, California Water Code Sections 13304 and 13307, was promulgated by the SWRCB as policies and procedures to be followed by the RWQCB's for oversight of investigations and cleanup and abatement decisions. Most of Resolution No. 92-49 contains procedural rather than substantive requirements and is therefore not an ARAR. Nevertheless, the Navy agrees with the State that Section III.G, which states that dischargers must abate the effects of the discharges "in a manner that promotes attainment of either background water quality, or the best water quality that is reasonable," is relevant and appropriate for groundwater.

Resolution No. 68-16: SWRCB Resolution No. 68-16, adopted pursuant to the Porter-Cologne Water Quality Act, Water Code Section 13140, is the State's "Statement of Policy with Respect to Maintaining

High Quality Waters in California." The State and the Navy disagree on whether Resolution No. 68-16 is an ARAR. The State asserts that Resolution No. 68-16 is a potential ARAR that governs the further migration of contaminated groundwater and requires cleanup of groundwater to background levels. The Navy asserts that Resolution No. 68-16 is prospective in intent, applying to new discharges in order to maintain existing high-quality waters.

Basin Plan: The Basin Plan, adopted pursuant to the Porter-Cologne Water Quality Act, Water Code Section 13240, identifies beneficial uses for surface water and groundwater and establishes numerical and narrative standards to protect those beneficial uses. As described in Section 2.1, the beneficial use of the groundwater underlying HPS does not include municipal supply for the following reasons: groundwater has never been used for such purposes, high TDS values in the A-aquifer, likely saltwater intrusion if pumping should occur, and limited groundwater availability in the bedrock water-bearing zone. For these same reasons, the Navy and State agree that the groundwater's beneficial uses do not include industrial service or process supply or agricultural supply. The only possible beneficial use of the groundwater is freshwater replenishment. The narrative water quality objectives for groundwater as they relate to freshwater replenishment are applicable; in addition, although not applicable because they apply to surface water, the numerical water quality objectives in Table 3-3 of the 1995 Basin Plan are relevant and appropriate to the extent that groundwater migrates into surface water.

Location-Specific ARARs

Location-specific requirements are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations. The only location-specific ARAR is the Coastal Zone Management Act. Under Section 307(c)(1) of the Coastal Zone Management Act, 16 U.S.C. Section 1456(c), federal activities affecting the coastal zone must be conducted in a manner consistent with the State's coastal zone management program. California's coastal zone management plan is found in the California Coastal Act, California Public Resources Code Section 30000 et seq. The Navy will evaluate the remedial action to ensure consistency with the coastal zone management plan. Although Pumphouse No. 3 in IR-26 is eligible for inclusion on the National Register, no remedial action will be undertaken that will affect the pumphouse. Therefore, the National Historic Preservation Act, 16 U.S.C. Section 470 et seq., is not an ARAR for Parcel B.

Action-Specific ARARs

These requirements are technology- or activity-based requirements or limitations on actions taken with respect to the hazardous substances. Discussed below are the potential action-specific ARARs for the remedial alternatives considered for Parcel B.

Hazardous Waste Regulations: Regulations adopted pursuant to the California Hazardous Waste Control Law, Health & Safety Code Section 25100 et seq., are action-specific ARARs common to both the soil and groundwater alternatives. These requirements will determine how excavated soil and extracted groundwater must be managed and disposed of. The Navy will analyze samples from excavated soils and extracted groundwater in accordance with the hazardous waste identification regulations in Title 22 of the California Code of Regulations (CCR), Division 4.5, Chapter 11, Articles 2-4 (40 CFR Part 261, Subparts B-D) to determine whether any of the media must be managed as a hazardous waste. If the media must be managed as hazardous waste, the substantive generator requirements in 22 CCR, Division 4.5, Chapter 12, Articles 1-3 (40 CFR Part 262, Subparts A-C) are applicable. As appropriate, excavated soil and extracted groundwater will be evaluated in accordance with 22 CCR, Division 4.5, Chapter 18, Article 1, Section 66268.7(a) (40 CFR Part 268.7(a)) to determine whether they are subject to land disposal restrictions.

Several of the soil and groundwater alternatives considered for Parcel B involve on-site treatment. If data indicate that the excavated soil or extracted groundwater contain a listed waste or concentrations of hazardous substances above the hazardous waste characteristic levels in 22 CCR, Division 4.5, Chapter 11 (40 CFR Part 261), the substantive requirements for miscellaneous units in 22 CCR, Division 4.5, Chapter 14, Article 16 (40 CFR Part 264 Subpart X) are potentially relevant and appropriate to the treatment unit. In addition, the standards for process vent requirements in 22 CCR, Division 4.5, Chapter 14, Article 27 (40 CFR Part 264, Subpart AA) for hazardous waste treatment units are potentially relevant and appropriate to alternatives involving air stripping.

Air Regulations: Several of the Bay Area Air Quality Management District (BAAQMD) regulations are ARARs for the soil remedial alternatives. First, substantive requirements in BAAQMD Regulation 6 and Regulation 8-40 are relevant and appropriate to excavation activities. Specifically, Regulations 6-301, 6-302, and 6-305, which contain particulate and visible emissions standards, are relevant and

appropriate. Regulation 8-40-301, which limits uncontrolled aeration, and Regulation 8-40-303, which contains requirements for soil storage piles, are also relevant and appropriate to those alternatives that involve stockpiling soil.

Additional BAAQMD regulations are ARARs for some of the alternatives involving treatment of contaminated soil or groundwater. Specifically, for those soil alternatives which include soil vapor extraction (SVE) and those groundwater alternatives which include air stripping, Regulation 8-47 is applicable. BAAQMD Regulation 8-47 requires implementation of emission controls if the emissions from an SVE system or an air stripper exceed 1 pound per day of selected VOCs. The BAAQMD has indicated that Regulation 8-47 is also an ARAR for any alternative that includes thermal desorption. Finally, for all alternatives which would have air emissions from on-site treatment units, the substantive requirements in BAAQMD Regulation 2-301, regarding the use of best available control technology (BACT) for new air emission sources, are relevant and appropriate.

Landfill Closure Regulations: Several of the soil alternatives include use of the soil as sub-base foundation material at the IR-1/21 landfill in Parcel E, assuming capping is the selected remedy for the landfill. State requirements for closure of landfills in 14 CCR, Division 7, Chapter 13, and in 23 CCR, Division 3, Chapter 15, are ARARs for activities conducted at the IR-1/21 landfill. ARARs relating to the landfill will be fully evaluated as part of the FS for Parcel E. The State has also indicated that these requirements should be considered as ARARs for alternatives involving on-site capping (i.e., Alternative S-8).

SWRCB Waste Discharge to Land Regulations (Chapter 15): In addition to the landfill closure requirements discussed above, the State has indicated that requirements in 23 CCR, Division 3, Chapter 15 pertaining to waste piles and groundwater monitoring should also be identified as ARARs. Based on the Navy's review of Chapter 15, the requirements in 23 CCR, Division 3, Chapter 15, Section 2546 on precipitation and drainage controls are considered relevant and appropriate for those alternatives involving stockpiling of soil. The State also believes that the detection monitoring requirements in 23 CCR, Division 3, Chapter 15, Section 2550.8 are relevant and appropriate. The Navy disagrees with the

State. Those requirements pertain to establishing background values, proposing monitoring parameters, and determining whether a statistically significant release has occurred. Background values have already been established for HPS. Moreover, elsewhere in this ROD, the Navy and the regulatory agencies have presented the proposed monitoring plan approach. Tables 5 and 6 summarize how the laws, regulations, and resolutions described above relate to the soil and groundwater alternatives evaluated in the FS and summarized in Section 2.8 of the ROD.

2.8 DESCRIPTION OF ALTERNATIVES

This section describes the soil and groundwater alternatives evaluated in detail during the FS (PRC 1996b), and presents the cleanup goals selected by the Navy. At the time the FS was prepared, IR-25 was within the boundaries of Parcel B. However, because of concerns related to DNAPL in that area, the Navy is evaluating additional remedial alternatives for IR-25. Because DNAPL is also present at IR-28 in Parcel C, the Navy plans to develop and select a remedy for IR-25 as part of the remedy selection process for Parcel C. For this reason, although the remedial alternatives set forth in the FS included actions to address contamination at IR-25, those components of the alternatives relating to IR-25 are not included in the description of alternatives in this ROD. For example, each of the soil alternatives in the FS included removal of DNAPL from IR-25; however, DNAPL removal is not included in the following descriptions. The costs and soil volumes have also been changed from the FS to exclude IR-25.

2.8.1 Soil Alternatives

During the FS, the Navy initially evaluated eight remedial alternatives for soil. Based on the initial screening, six alternatives, including the no-action alternative, were retained for detailed analysis and comparison. The soil alternatives (excluding the no-action alternative) are summarized in Table 7 below and described in detail in the following paragraphs.

TABLE 5

ARARS[a] FOR SOIL ALTERNATIVES

	Alt S-1	Alt S-2	Alt S-3	Alt S-4	Alt S-6	Alt S-8
Chemical-Specific ARARs						
Basin Plan	The Navy and State do not agree that the Basin Plan is an ARAR. However, other than the no action alternative, all alternatives will, through soil source removal activities, satisfy Basin Plan objectives regardless of whether it's an ARAR.					
SWRCB Resolution No. 92-49	The Navy and State do not agree that Resolution No. 92-49 is an ARAR for the soil alternatives. However, other than the no action alternative, all alternatives will, through soil source removal activities, satisfy Resolution No. 92-49.					
Action-Specific ARARs						
Hazardous waste identification regulations [22 CCR, Div. 4.5, Chap. 11, Art. 2-4/40 CFR Part 261, Subparts B-D]	These requirements are not applicable because no contaminated media is generated.	These requirements are applicable for soil that will be excavated and disposed off site. The excavated soil would be analyzed to determine appropriate management and disposal practices.				
Generator requirements [22 CCR, Div. 4.5, Chap. 12, Art. 1-3/40 CFR Part 262, Subparts A-C]	These requirements are not applicable because no contaminated media is generated.	The substantive generator requirements are applicable if excavated soil exhibits a hazardous waste characteristic or contains a listed hazardous waste and is being managed in containers on site for less than 90 days.				

TABLE 5 (Continued)

ARARS[a] FOR SOIL ALTERNATIVES

	Alt S-1	Alt S-2	Alt S-3	Alt S-4	Alt S-6	Alt S-8
Land disposal restrictions [22 CCR, Div. 4.5, Chap. 18, Art. 1, Sec. 66268.7(a)/40 CFR Part 268.7(a)]	These requirements are not applicable because no contaminated media is generated.	These requirements are applicable for excavated soil. Excavated soil would be analyzed to determine if treatment is required, either on site or by the off-site landfill operator, prior to disposal.				
Miscellaneous treatment unit requirements for hazardous waste [22 CCR, Div. 4.5, Chap. 14, Art. 16/40 CFR, Part 264, Subpart X]	These requirements are not ARARs because this alternative does not involve treatment.	These requirements are not ARARs because this alternative does not involve treatment.	These requirements are relevant and appropriate for the treatment unit if the excavated soil must be managed as a hazardous waste.			
Control of visible emissions and particulates (Bay Area Air Quality Management District Regulation (BAAQMD) 6-301)	These requirements are not ARARs because no emissions or particulates will be generated.	These requirements are relevant and appropriate for excavation activities. Appropriate controls will be in place to control emissions.				

TABLE 5 (Continued)

ARARS[a] FOR SOIL ALTERNATIVES

	Alt S-1	Alt S-2	Alt S-3	Alt S-4	Alt S-6	Alt S-8
Aeration of soil (BAAQMD Regulation 8-40)	These requirements are not ARARs because this alternative does not involve excavation of soil.	These requirements are relevant and appropriate for stockpiling of excavated soils.				
Use of BACT for new sources (BAAQMD Regulation 2-301)	This requirement is not an ARAR for Alternatives S-1 and S-2 because these alternatives do not involve treatment.		These requirements are relevant and appropriate for the treatment units.			These requirements are not ARARs because Alt. S-8 does not involve treatment.
Emissions requirements for soil vapor extraction systems (BAAQMD Regulation 8-47)	These requirements are not ARARs for Alternatives S-1 and S-2 because these alternatives do not involve on-site treatment.		These requirements are applicable to the SVE unit.	These requirements are applicable to the SVE unit.	BAAQMD asserts these requirements would apply to the thermal desorption unit	These requirements are not applicable because this alternative does not use SVE.
Landfill closure requirements (14 CCR, Div. 7, Chap. 13 and 23 CCR, Div. 3, Chap. 15)	These requirements are not ARARs because capping is not a component of these alternatives.		These regulations would be considered in evaluating potential ARARs for the IR-1/21 landfill.			The RWQCB asserts that the Chapter 15 requirements apply to the cap proposed under this alternative

TABLE 5 (Continued)

ARARS[a] FOR SOIL ALTERNATIVES

	Alt S-1	Alt S-2	Alt S-3	Alt S-4	Alt S-6	Alt S-8
Waste discharge to land requirements (23 CCR, Div. 3, Chap. 15, Section 2546)	These requirements are not applicable because no contaminated media is generated.	These requirements would be relevant and appropriate for soil stockpiles. Appropriate precipitation and drainage controls would be incorporated into the design of the stockpile.				
Location-Specific ARARs						
Coastal zone management plan consistency (Coastal Zone Management Act, 16 U.S.C. Section 1456(c))	This requirement is not an ARAR because this alternative does not involve any action.	This requirement is applicable to the extent that remedial activities take place within the coastal zone.				

Notes:

[a] As explained in Section 2.7 and this table, the Navy does not agree that all the requirements listed are, in fact, ARARs.

TABLE 6

ARARS[a] FOR GROUNDWATER ALTERNATIVES

ARAR	Alternative GW-1	Alternative GW-2	Alternative GW-3	Alternative GW-5
Chemical-Specific ARARs				
San Francisco Bay Water Quality Control Plan	The Navy recognizes that the Basin Plan must be considered to determine the potential beneficial uses of groundwater at Parcel B as the beneficial use will guide the remedial goals. The Navy does not believe any beneficial uses for groundwater underlying Parcel B are present, including freshwater replenishment. By removing the sources and monitoring, the State agrees that Alternative GW-2 satisfies the Basin Plan goals with respect to freshwater replenishment. Alternatives GW-3 and GW-5 would also satisfy these goals.			
SWRCB Resolution No. 88-63, Sources of Drinking Water Policy	The Navy and the State do not agree on whether groundwater underlying Parcel B meet the criteria as a potential drinking water source. Nevertheless, the Navy and State agree that drinking water standards are neither applicable nor relevant or appropriate for Parcel B.			
SWRCB Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304	Section III.G of Resolution No. 92-49, which requires dischargers to abate the effects of discharges "in a manner that promotes attainment of either background water quality, or the best water quality that is reasonable," is relevant and appropriate. By removing the source (i.e., the soil), all of the groundwater alternatives, except GW-1, will promote the only possible beneficial use of groundwater (i.e., freshwater replenishment)			
SWRCB Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California	As discussed in Section 2.7 of this ROD, the Navy and the State disagree as to whether Resolution No. 68-16 is an ARAR. With the exception of GW-1, the State believes that by removing source areas and continued monitoring, Alternatives GW-2, GW-3, and GW-5 would meet the requirements of Resolution 68-16 regardless of whether it is an ARAR			

TABLE 6 (Continued)

ARARS[a] FOR GROUNDWATER ALTERNATIVES

ARAR	Alternative GW-1	Alternative GW-2	Alternative GW-3	Alternative GW-5
Action-Specific ARARs				
Hazardous waste identification regulations (22 CCR, Div. 4.5, Chap. 11, Art. 2-4/40 CFR Part 261, Subparts B-D)	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not result in the generation of contaminated media.		These requirements are applicable to Alternatives GW-3, and GW-5. Extracted groundwater would be analyzed to determine appropriate management and disposal practices.	
Generator requirements (22 CCR, Div. 4.5, Chap. 12, Art. 1-3/40 CFR Part 262, Subparts A-C)	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not result in the generation of contaminated media.		These requirements would be applicable if extracted groundwater exhibits hazardous waste characteristics and is shipped off site.	
LDR regulations (22 CCR, Div. 4.5, Chap. 18, Art. 1, Sec. 66268.7(a)/(40 CFR Part 268.7(a))	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not result in the generation of contaminated media.		These requirements are applicable if extracted groundwater must be managed as a hazardous waste and is shipped off site for disposal.	

TABLE 6 (Continued)

ARARS[a] FOR GROUNDWATER ALTERNATIVES

ARAR	Alternative GW-1	Alternative GW-2	Alternative GW-3	Alternative GW-5
Miscellaneous treatment unit requirements for hazardous waste (22 CCR, Div. 4.5, Chap. 14, Art. 16/40 CFR, Part 264 Subpart X)	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not involve treatment.		These requirements are relevant and appropriate for the air stripping unit if the extracted groundwater exhibits hazardous waste characteristics.	These requirements are not ARARs because Alt. GW-5 does not involve treatment.
Air stripping emissions requirements (BAAQMD Regulation 8-47)	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not involve treatment.		These requirements are applicable to the air stripper. The air stripper would be operated in accordance with these requirements.	These requirements are not ARARs because Alt. GW-5 does not involve treatment.

TABLE 6 (Continued)

ARARS[a] FOR GROUNDWATER ALTERNATIVES

ARAR	Alternative GW-1	Alternative GW-2	Alternative GW-3	Alternative GW-5
Air emissions for process vents from hazardous waste treatment units [22 CCR, Div. 4.5, Chap. 14, Art. 16/40 CFR Part 264, Subpart AA]	These requirements are not ARARs for Alts. GW-1 and GW-2 because these alternatives do not involve treatment.		These requirements may be relevant and appropriate for the air stripper depending on the concentrations of hazardous substances in the extracted groundwater.	These requirements are not ARARs because Alt. GW-5 does not involve treatment.
Location-Specific ARARs				
Coastal zone management plan consistency (Coastal Zone Management Act, 16 U.S.C. Section 1456(c))	This requirement is not an ARAR because this alternative does not involve any action.	This requirement is applicable to the extent that remedial activities take place within the coastal zone.		

Notes:

[a] As explained in Section 2.7 and this table, the Navy does not agree that all the requirements listed are, in fact, ARARs.

TABLE 7

COMPONENTS OF SOIL ALTERNATIVES

Remedy Component	Alternative				
	S-2	S-3	S-4	S-6	S-8
Off-Site Management	X	X	X	X	X
On-Site Soil Vapor Extraction		X	X		
On-Site Thermal Desorption				X	
On-Site Asphalt Encapsulation or Solidification and Stabilization			X	X	
Use of Excavated Soil for the IR-1/21 Landfill Cap Foundation		X	X	X	
Placement of Treated Soils				X	
Capping					X

Several elements are common to all of the alternatives (excluding the no-action alternative). Common elements include the cleanup goals for soil remaining on Parcel B and off-site management options for contaminated soil. These common elements are described below.

The remedial action objective for soil is to prevent ingestion of, direct dermal contact with, or inhalation of hazardous substances in soil. To achieve this objective, the FS considered different soil cleanup goals corresponding to carcinogenic risks of 10^{-4}, 10^{-5}, and 10^{-6} under both future industrial and future residential scenarios. Although only certain portions of Parcel B are slated for residential use under the current reuse plan, the Navy proposes to clean up the entire parcel to residential risk-based standards. As explained in Section 2.6.1, the NCP establishes an acceptable risk range of 10^{-4} to 10^{-6} and a point of departure for remedial alternatives of 10^{-6} for carcinogens. The Navy has chosen to set its cleanup goal at the lower end of the risk range, which is more protective of human health. In short, the Navy has established the following cleanup goals for soil remaining on Parcel B:

- Excess lifetime cancer risk of 10^{-6} or less for carcinogens, except where ambient concentrations of inorganic compounds exceed 10^{-6} because of the fill material
- HI of 1 or less for noncarcinogens, except where ambient concentrations of inorganic compounds exceed an HI of 1 because of the fill material
- Lead levels of less than 221 mg/kg

Chemical-specific cleanup goals for soil remaining on Parcel B were calculated to correspond to a risk level of 10^{-6} or an HI equal to 1. These cleanup goals are listed in Table 8. However, because of the limits of analytical methodologies, it may not be possible to achieve some of these cleanup goals; for those compounds, the cleanup goal is the detection limit.

With the exception of the no-action alternative (Alternative S-1), the soil alternatives rely to some extent on management of excavated soil at off-site facilities. The management options available for contaminated soil depend on the regulatory requirements for hazardous waste set forth in 22 CCR, Division 4.5. Soil management options that would apply to each of the alternatives are identified on Table 9.

Based on the analytical data gathered during the RI (PRC 1996a), the Navy anticipates that the majority of excavated soil would be suitable for landfill disposal. Analytical testing of the soils will be conducted

TABLE 8

SOIL CLEANUP STANDARDS

Compound	Cleanup Goal (mg/kg)[a]
Volatile Organic Compounds	
Benzene	0.035
Bromoform	0.081
Carbon disulfide	12.7
Carbon tetrachloride	0.074
Chlorobenzene	21.5
Chloroform	0.051
1,2-Dichloroethane	0.019
1,1-Dichloroethene	0.007
1,2-Dichloroethene (total)	9.1
cis-1,2-Dichloroethene	8.8
trans-1,2-Dichloroethene	22.8
Ethylbenzene	227.6
Freon 113	13,334.7
Methyl ethyl ketone	62.1
Methyl isobutyl ketone	27.3
Styrene	313.9
Tetrachloroethene	0.161
Toluene	231.9
1,1,1-Trichloroethene	12.0
1,1,2-Trichloroethene	0.030
Trichloroethene	0.271
Vinyl acetate	62.3
Vinyl chloride	0.002 (0.01)
Xylene (total)	888.5
Semivolatile Organic Compounds	
Acenaphthene	141.1
Acenaphthylene	130.1
Anthracene	967.9
Benzo(a)anthracene	0.117
Benzo(a)pyrene	0.016 (0.33)
Benzo(b)fluoranthene	0.030

TABLE 8 (Continued)

SOIL CLEANUP STANDARDS

Compound	Cleanup Goal (mg/kg)[a]
Benzo(g,h,i)perylene	355.3
Benzo(k)fluoranthene	0.030 (0.33)
Benzoic acid	2,181.7
Carbazole	0.635
Chrysene	0.247 (0.33)
Dibenzo(a,h)anthracene	0.00019 (0.33)
Dibenzofuran	13.4
1,2-Dichlorobenzene	157.7
1,4-Dichlorobenzene	0.221 (0.33)
Diethylphthalate	651.8
2,4-Dimethylphenol	27.7
Fluoranthene	157.5
Fluorene	105.0
Indeno(1,2,3-cd)pyrene	0.038 (0.33)
2-Methylnaphthalene	140.7
N-Nitrosodiphenylamine	1.1
N-Nitrosodipropylamine	0.00017 (0.33)
Naphthalene	68.8
Pentachlorophenol	0.191 (0.8)
Phenanthrene	127.2
Phenol	137.7
Pyrene	123.0
1,2,4-Trichlorobenzene	27.8
Metals	
Aluminum	73,547.7
Antimony	10.2
Arsenic	11.1
Barium	2,650.1
Beryllium	0.7 (0.8)
Cadmium	3.1
Trivalent Chromium	58,891.9
Hexavalent Chromium	0.0 (0.05)

TABLE 8 (Continued)

SOIL CLEANUP STANDARDS

Compound	Cleanup Goal (mg/kg)[a]
Cobalt	3,124.7
Copper	157.3
Lead	221.0
Magnesium	0.0 (1,000)
Manganese	2,264.1
Mercury	2.3
Molybdenum	47.2
Nickel	314.7
Selenium	141.8
Silver	50.6
Thallium (carbonate)	6.0
Vanadium	446.8
Zinc	365.4
Pesticides/Polychlorinated Biphenyls	
Aldrin	0.00147 (0.0017)
alpha-Chlordane	0.280
Aroclor 1242	0.002 (0.016)
Aroclor 1254	0.00041 (0.016)
Aroclor 1260	0.005 (0.016)
4,4'-DDD	0.166
4,4'-DDE	0.155
4,4'-DDT	0.040
Endosulfan I	17.3
Endosulfan II	15.1
Endosulfan sulfate	15.7
Endrin aldehyde	2.1
Endrin ketone	21.3
gamma-Chlordane	0.00076 (0.0017)
Heptachlor	0.003
Heptachlor epoxide	0.00038
Methoxychlor	25.5

TABLE 8 (Continued)

SOIL CLEANUP STANDARDS

Compound	Cleanup Goal (mg/kg)[a]
Other	
Cyanide (total)	0.165 (2.0)

Notes:

a Number in parentheses is the analytical detection limit. For compounds where the concentration level corresponding to a risk level of 10^{-6} is below the detection limit, the detection limit is the cleanup goal.

TABLE 9

OFF-SITE MANAGEMENT APPROACHES FOR CONTAMINATED SOILS

Soil Characteristics	Off-Site Management Approach
Soils containing a listed hazardous waste	Treatment by incineration or stabilization with treatment residuals managed as a hazardous waste
Soils exhibiting a Federal toxicity characteristic for organic compounds	Incineration with treatment residuals managed as a hazardous waste
Soils exhibiting a Federal toxicity characteristic for organic and inorganic compounds	Incineration with treatment residuals managed as a hazardous waste
Soils exhibiting a Federal toxicity characteristic for inorganic compounds	Stabilization followed by Class I landfill disposal
Non-RCRA hazardous soils and debris	Appropriately permitted disposal facility
Hazardous debris	Encapsulation followed by Class I landfill disposal

to determine the appropriate off-site management approach before the soils are shipped to an off-site facility.

Alternative S-1: No Action

Under this alternative, no remedial action would be taken. Rather, Parcel B soil would be left as is, without implementation of institutional controls, containment, treatment, or removal.

Alternative S-2: Deed Notification; Excavation and Off-Site Disposal

Under this alternative, soil presenting a potential human health risk above the cleanup goals would be excavated to the groundwater table. Section A-1 of IR-6 which remained from the removal action will also be remediated to the groundwater table. Based on data collected during the RI, the total volume of soil to be excavated is estimated to be 38,000 cubic yards. For areas requiring large excavations, primarily sites IR-07 and IR-18, stockpile management areas may be established. In these areas, run-on and runoff controls would be implemented, and collected runoff would be stored on site, sampled, and discharged to the publicly owned treatment works (POTW) or shipped off site for disposal, as appropriate depending on the characteristics of the runoff. Because the stockpiles would be within the area of contamination, land disposal restrictions would not be triggered. Soil that must be managed as a hazardous waste would be placed in containers if stored outside the area of contamination. The soil would be shipped off site for disposal; treatment by the landfill operator may be required prior to disposal if land disposal restrictions are triggered. Clean backfill would be used to restore the excavated areas. A notification will be placed on the deed indicating that soil below the groundwater table in remediated areas as specified in the remedial action close-out report may be contaminated. All future soils excavated from below the groundwater table in the remediated areas must be managed in accordance with federal, State and local laws and requirements including local ordinances such as Articles 4.1 and 20 of the San Francisco Public Works Code. In addition, any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals presented in Table 8 of this ROD will be restricted from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone.

Section 2.7 discusses the ARARs for all alternatives. Table 5 identifies which of the requirements in Section 2.7 are pertinent to Alternative S-2.

The estimated present value of this alternative is $11,161,000. This estimate includes only capital costs; there are no operation and maintenance (O&M) costs associated with this alternative. The estimated time to implement this remedy is approximately 12 to 18 months for preconstruction activities and approximately 3 to 6 months for mobilization, construction, and demobilization.

Alternative S-3: Soil Vapor Extraction of VOC-Containing Soils; Excavation and On-Site Use as Foundation Cap Material or Off-Site Disposal of Soils Containing SVOCs and Inorganic Compounds

Under Alternative S-3, except for VOC-containing soil at IR-10, contaminated soil up to 10 feet would be excavated and disposed of off site, as described under Alternative S-2, or used as sub-base foundation cap material at the IR-1/21 landfill in Parcel E.

A total of approximately 35,700 cubic yards of soil containing SVOCs, inorganic compounds, or VOCs combined with SVOCs and/or inorganic compounds would be excavated. If the leachate from the soil does not exceed NAWQC (adjusted to take into account ambient metals concentrations in groundwater), the soil would be used as sub-base foundation layer material beneath the cap at the IR-1/21 landfill in Parcel E, assuming that capping is the selected remedy for that site. The decision whether to cap the landfill would be evaluated in the Parcel E FS Report. Soil destined for placement at the landfill may be stored until a final decision on the remedy for the landfill is reached. Because the soil would not contain hazardous waste, hazardous waste requirements would not apply to the soil storage unit. Soils exceeding the criteria for use as landfill cap foundation material would be sent off site for disposal; treatment at the landfill to meet land disposal restrictions may be required.

Based on the RI, approximately 18,000 cubic yards would be managed off site, and approximately 17,500 cubic yards would be used at the IR-1/21 landfill. The excavated areas in Parcel B would be filled with clean backfill.

Soils containing only VOCs at IR-10 would be treated on site by soil vapor extraction (SVE). Approximately 900 cubic yards of soil would be treated by SVE using 2 vertical vapor extraction wells. If predesign sampling indicates a greater area of contamination than currently estimated at IR-10, additional extraction wells may be installed.

ARARs are discussed in Section 2.7. Table 5 identifies which are the requirements in that section that are pertinent to Alternative S-3.

The estimated present value of this alternative is $8,554,000. No O&M costs are associated with this alternative. Approximately 12 to 18 months would be required for design activities before construction. Approximately 6 to 9 months would be required for construction activities. The length of time the SVE would operate would depend on soil conditions; preliminarily, it is estimated that approximately 6 to 18 months would be required to meet the cleanup goals.

Alternative S-4: SVE of VOC-Containing Soils; Excavation and Off-Site Disposal or On-Site Asphalt Encapsulation, Stabilization, and Use of Soils Containing SVOCs, Inorganic Compounds, or Combined Organic and Inorganic Compounds as Foundation Cap Material

Alternative S-4 is similar to Alternative S-3 except that on-site asphalt encapsulation and stabilization would be used to treat, as necessary, certain excavated soils for use as sub-base foundation layer material for the IR-1/21 landfill cap.

Soil containing only VOCs at IR-10 would be treated on site using SVE as described under Alternative S-3.

The remaining soil contains SVOCs, inorganic compounds, or combined organic and inorganic compounds. Approximately 35,700 cubic yards of soil would be excavated. The excavated soil that exhibits hazardous waste characteristics would be shipped off site. As needed to meet the landfill cap foundation layer criteria, the remaining soil would be stabilized and encapsulated before placed at the IR-1/21 landfill. Treated soil that does not meet the criteria for the landfill cap foundation would be disposed of off site. Under stabilization and encapsulation, the contaminated soil is mixed with reagents to form a hard, asphalt-like substance that prevents hazardous substances from leaching. During the

design phase, bench-scale tests and treatability studies would be performed to identify the most appropriate technology process as well as operating conditions and pretreatment requirements.

ARARs are discussed in Section 2.7. Table 5 identifies those requirements that are pertinent to this remedial alternative.

The estimated present value of this alternative is $9,832,000. No O&M costs are associated with this alternative. Preconstruction activities, including bench-scale tests and treatability studies, would last approximately 15 to 21 months. Construction activities, including installation of the SVE system, excavation, and soil stabilization, would last approximately 7 to 10 months. The length of time the SVE system would operate depends on the soil conditions, but the preliminary estimate is that it would operate 6 to 18 months to achieve the cleanup goals for soil remaining on Parcel B.

Alternative S-6: Excavation; On-Site Treatment by Thermal Desorption and/or Solidification/Stabilization as Necessary; and On-Site Use as Foundation Cap Material at the IR-1/21 Landfill or Off-Site Disposal

Under Alternative S-6, soil containing concentrations of contaminants above the cleanup goals for soil remaining on site would be excavated up to a depth of 10 feet and, as necessary, treated. The treatment technology and ultimate disposition of the soil would depend on the type and concentrations of hazardous substances in the soil.

Soil containing organic compounds only would be treated using thermal desorption. If the treated soil meets the cleanup goals for soil remaining on site, the soil would be replaced in the excavated areas on Parcel B. Otherwise, the treated soil would be transported off site for disposal.

Soil containing both organic and inorganic compounds would also be treated by thermal desorption. As necessary to meet the criteria established for using the soil as sub-base foundation material beneath the cap at the IR-1/21 landfill (leachate below NAWQC adjusted for ambient metals concentrations), the treated soil would then be combined with soil containing only inorganic compounds and solidified and stabilized. Soil that meets the criteria would be used as sub-base foundation cap material. Otherwise, the soil would be disposed off site. Clean backfill would be placed in the excavated areas. Oil or condensed

organic treatment residuals from the thermal desorption unit would be shipped off site for incineration. Other solid waste streams, such as cyclone and baghouse residuals, would be blended with contaminated soil to reduce the moisture content of the feed material and to retreat the fines. The fines would be used as part of the sub-base foundation material if the concentrations in the material meet the criteria for such use.

A general discussion of ARARs is provided in Section 2.7. Those requirements that are pertinent to this alternative are identified in Table 5.

Under this alternative, approximately 12,250 cubic yards of soil would be treated by thermal desorption and up to 24,750 cubic yards would be solidified and stabilized. A total of approximately 30,000 cubic yards of soil would be used for the cap foundation layer at the IR-1/21 landfill.

The present value of this alternative is approximately $15,853,000. No O&M costs are associated with this alternative. Preconstruction activities would last approximately 15 to 21 months and excavation and construction, treatment system operation, and demobilization would last approximately 9 to 12 months.

Alternative S-8: Capping at IR-07 and IR-18; Excavation and Off-Site Disposal of Soil from Other Areas

Alternative S-8 involves capping contaminated soil at two locations and, for the other areas, excavation and off-site disposal of contaminated soil as described under Alternative S-2. This alternative would be implemented in conjunction with groundwater Alternative GW-5, discussed in Section 2.8.2.

Under the capping component of this alternative, the existing asphalt at IR-07 and IR-18 would be removed and replaced with a new asphalt cap to prevent exposure to lead in soil. The cap would extend over approximately 600,000 square feet and cover approximately 32,800 cubic yards of contaminated soil. Monitoring of the cap would be required to ensure its integrity. In addition, institutional controls would be implemented to minimize disturbance of the cap. Under this alternative, 3,700 cubic yards would be treated and/or disposed off site, depending on the soil characteristics.

ARARs are generally discussed in Section 2.7. Table 5 identifies those requirements that are pertinent to Alternative S-8.

The estimated present value of Alternative S-8 is $3,655,000. Predesign and remedial design activities would last approximately 12 to 15 months and excavation, capping, and demobilization would last approximately 6 to 9 months.

2.8.2 Groundwater Alternatives

The FS identified two remedial action objectives for groundwater:

- Prevention of inhalation of VOCs from A-aquifer groundwater that enters into buildings
- Prevention of exposure of aquatic receptors to contaminated groundwater migrating to San Francisco Bay

The only area in which inhalation of VOCs from groundwater is considered a concern is in the vicinity of IR-25. Thus, the FS (PRC 1996b) considered alternatives to address this area. The potential threat to aquatic receptors was evaluated by comparing groundwater concentrations to NAWQC, the Basin Plan water quality objectives, and ambient metals groundwater concentrations at HPS. Based on this comparison, sites IR-06, IR-07, IR-10, and IR-25 contain chemical concentrations in groundwater above these criteria. Based on dilution and attenuation modeling, it was determined that at the groundwater/surface water interface, the chemical concentrations at IR-06 and IR-10 will drop below these levels at the tidally influenced zone. For this reason, the FS focused on alternatives to address IR-07 and IR-25. However, as explained in Section 2.4, IR-25 has now been moved into Parcel C. Therefore, the following description of alternatives does not include IR-25, even though that area was originally considered in the FS.

Five groundwater alternatives were initially identified during the FS (PRC 1996b) to address the remedial action objectives. Based on the preliminary analysis, four alternatives were evaluated in detail in the FS. Each of these alternatives is described below. More detailed information is provided in Section 5.2 of the FS report (PRC 1996b).

Alternative GW-1: No Action

Under this alternative, no action would be taken to address groundwater contamination. Rather, contaminated groundwater would be left as is.

Alternative GW-2: Deed Restrictions; Deed Notification; Lining of Storm Drain System; Removal of Steam Lines and Fuel Lines; Groundwater Monitoring

Alternative GW-2 consists of several components. First, even though future groundwater use is unlikely, under this alternative, restrictions would be placed on the deed prohibiting all future uses of groundwater. Second, potential preferential pathways for direct groundwater discharge to the Bay would be eliminated. Specifically, sections of the storm drain system that are below the groundwater table would be lined to prevent groundwater from infiltrating into the system and discharging to the Bay. Sections of the storm drain system to be lined are located in IR-07 and IR-10. The specific sections of the system to be lined would be determined during an infiltration study. In those areas requiring lining, the sewer bedding material would be pressure grouted. Fuel and steam lines would also be removed under this alternative. Stained soil encountered during the fuel pipeline removal would be excavated and treated as part of the selected soil alternative or in accordance with the HPS petroleum CAP, depending on the type of contaminant detected. At IR-07, nickel and copper exceed the water quality criteria in the tidally influenced zone. Potential sources include spent sandblast grit and bedrock derived fill. The distribution of nickel in soil samples collected in the area of the nickel groundwater plume is sporadic with only 4 out of 92 samples exceeding the ambient levels. The distribution of nickel exceedances in groundwater is equally sporadic and limited. To address this problem, the Navy will remove the soil at IR-07 from the ground surface to the water table to include nickel contaminated soil that could be leaching to the groundwater, followed by groundwater monitoring to evaluate the efficiency of the source removal. Post remediation groundwater monitoring for four quarters will be implemented to evaluate the need for contingency groundwater actions.

In addition, a notification will be added to the deed indicating that contamination may be present in the groundwater and in the soils below the groundwater table in the remediated areas as specified in the remedial action close-out report. All future excavation of soils and groundwater from below the groundwater table in the remediated areas where contamination may be present must be managed in

accordance with federal, State and local laws and requirements including local ordinances such as Articles 4.1 and 20 of the San Francisco Public Works Code. In addition, any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals presented in Table 8 of this ROD will be restricted from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone. Surface discharge of contaminated groundwater is prohibited.

Groundwater monitoring for up to 30 years would be implemented to track hazardous substance migration toward San Francisco Bay, ensure all contaminants posing ecological threats from all possible Parcel B sites and sources will be tracked and evaluated, and monitor the effectiveness of soil remediation activities at IR-07 and IR-10. Groundwater at IR-10 shall be monitored to track the potential degradation of TCE to vinyl chloride. TCE which occurs at lower levels as part of the same contaminant plume in the adjacent IR-24 site will also be addressed by this groundwater monitoring in IR-10. Should the levels of vinyl chloride increase, the Navy will activate the groundwater contingency measures. Since IR-07 is located within the tidally influenced zone, monitoring wells at that site would be placed to monitor the effectiveness of the soil remedy. Table 10 presents the groundwater monitoring trigger levels that will be used to evaluate the monitoring well data.

ARARs are generally discussed in Section 2.7. The pertinent ARARs for this alternative are identified on Table 6 estimated present value of this alternative, including capital and O&M costs, is $3,622,000. Implementation of this alternative would be expected to take 12 to 18 months.

Alternative GW-3: Deed Restrictions; Lining of Storm Drain System; Removal of Steam Lines and Fuel Lines; Groundwater Monitoring; Groundwater Extraction, Pretreatment, and Discharge to POTW from IR-07

In addition to the actions described under Alternative GW-2, GW-3 would involve the extraction of A-aquifer groundwater from IR-07. The extraction system would consist of seven wells with a combined pumping rate of 17.5 gallons per minute (gpm). Modeling data indicate that the IR-07 system would operate for up to 30 years. As necessary, the collected groundwater would first be treated by equalization. TPH, which separates out in the equalization tank, would be shipped off site for treatment and disposal. The groundwater would then be treated using air-stripping before it would be discharged to

TABLE 10
GROUNDWATER MONITORING TRIGGER LEVELS - PARCEL B
HUNTERS POINT SHIPYARD - SAN FRANCISCO, CALIFORNIA

		National Ambient Water Quality Criteria Saltwater Aquatic Life Protection [3] (µg/L)					
	RWQCB Basin Plan [2]	Recommended Criteria	Additional Toxicity Information Aquatic Life			HGAL[4]	Trigger Levels
Constituent [1]	(µg/L)		Acute	Chronic	1/10th Acute	(µg/L)	(µg/L)
INORGANICS							
Antimony	--	500	--	--	--	43.26	500
Barium	--	--	50,000 [6]	--	5,000	504.20	5,000
Beryllium	--	--	--	--	--	1.40	1.40
Cadmium	9.3	9.3	--	--	--	5.08	9.3
Chromium (III)	--	--	10,300 [7]	--	1,030	15.66	1,030
Chromium (VI)	50	50	--	--	--	NA	50
Copper	2.9	2.4	--	--	--	28.04	28.04
Lead	5.6	8.1	--	--	--	14.44	14.44
Manganese	--	--	--	--	--	8,140	8,140
Mercury	0.025	0.025	--	--	--	0.60	0.60
Nickel	7.1	8.2	--	--	--	96.48	96.48
Silver	2.3	0.92	--	--	--	7.43	7.43
Thallium	--	--	2,130	--	213	12.97	213
Zinc	58	81	--	--	--	75.68	75.68
ORGANICS							
Benzene	--	--	5,100	--	510	NA	510
Chloroform	--	--	12,000	6,400	--	NA	6,400
1,2-Dichloroethane	--	--	113,000	--	11,300	NA	86 *
1,2-Dichloroethene	--	--	224,000	--	22,400	NA	85 *
2,6-Dinitrotoluene	--	--	590	--	59	NA	59
Heptachlor epoxide	--	0.0036	--	--	--	NA	0.0036

TABLE 10 (Continued)
GROUNDWATER MONITORING TRIGGER LEVELS - PARCEL B
HUNTERS POINT SHIPYARD - SAN FRANCISCO, CALIFORNIA

		National Ambient Water Quality Criteria Saltwater Aquatic Life Protection [3] (µg/L)					
	RWQCB Basin Plan [2]	Recommended Criteria	Additional Toxicity Information Aquatic Life			HGAL[4]	Trigger Levels
Constituent [1]	(µg/L)		Acute	Chronic	1/10th Acute	(µg/L)	(µg/L)
Hexachloroethane	--	--	940	--	94	NA	94
Naphthalene	--	--	2,350	--	235	NA	235
Pentachlorophenol	--	7.9	--	--	--	NA	7.9
Phenanthrene	--	4.6	300	--	--	NA	4.6
Tetrachloroethylene (PCE)	--	--	10,200	450	--	NA	145 *
1,1,2,2-Tetrachloroethane	--	--	9,020	--	902	NA	147 *
1,1,1-Trichloroethane	--	--	31,200	--	3,120	NA	117 *
Trichloroethylene (TCE)	--	--	2,000	--	200	NA	114 *
Vinyl chloride	--	--	--	--	--	--	55 *

Notes:

1 Only constituents that (a) have water quality criteria or HGALs and (b) were detected by analysis are presented.

2 Values represent most stringent water quality objective for surface waters with salinities greater than or equal to 5 parts per thousand, taken from the California Regional Water Quality Control Board (RWQCB) Basin Plan, Region 2, Table 3-3 (RWQCB 1995c)

3 The national ambient water quality criteria (NAWQC) is the most stringent value of the saltwater aquatic life protection recommended criteria and toxicity criteria (RWQCB 1995a).

4 See Appendix A for information. HGALs do not exist for chromium (VI), cyanide, and organics, because they are not considered naturally occurring. HGALs apply only to A-aquifer groundwater.

5 HGAL-adjusted criteria were developed by comparing HGALs with the more stringent value of the (1) NAWQC for protection of saltwater aquatic life and (2) RWQCB Basin Plan, Region 2, water quality objectives. The HGAL replaced the selected water quality criterion only when the HGAL was greater than the water quality criterion. The values comprise the HGAL-adjusted criteria. HGAL-adjusted criteria apply only to A-aquifer groundwater.

6 U.S. EPA, Quality Criteria for Water, 1986, EPA 440/5-86-001

7 *Based on total chromium*

-- Data is not available

* Human health-based criteria were developed for VOCs that may represent a human health risk to a future resident at Parcel B. Concentrations of these VOCs in groundwater correspond to an ELCR of 10^{-6} and were selected as a groundwater RAO for protection of human health based on groundwater to indoor air modeling analysis.

NA Not applicable. For example, HGALs are not applicable to organics.

TABLE 10 (Continued)
GROUNDWATER MONITORING TRIGGER LEVELS - PARCEL B
HUNTERS POINT SHIPYARD - SAN FRANCISCO, CALIFORNIA

HGAL	Hunters Point groundwater ambient level
NAWQC	National Ambient Water Quality Criteria
RWQCB	Regional Water Quality Control Board
µg/L	micrograms per liter

the local POTW for treatment and disposal. The ability to discharge to the POTW would depend on whether the discharge meets POTW concentration and volume limitations. The POTW has indicated that the potential volume of extracted groundwater, as well as expected concentrations, would be accepted by the POTW.

A general discussion of ARARs is provided in Section 2.7. The pertinent requirements related to this alternative are noted on Table 6.

The estimated present value of this alternative is $4,630,000. Implementation of this alternative would last approximately 15 to 21 months. Groundwater extraction could continue for up to 30 years.

Alternative GW-5: Deed Restrictions; Lining of Storm Drain System; Removal of Steam Lines and Fuel Lines; Groundwater Monitoring; Slurry Wall Containment and Cap at IR-07

Under Alternative GW-5, the actions described under Alternative GW-2 would be implemented. In addition, this alternative includes installation of a 2,000-foot soil-bentonite slurry wall at IR-07 to prevent migration of hazardous substances to the Bay. The slurry wall would extend approximately 40 feet bgs, to the Bay Mud Deposits or the bedrock. Short-term permeability testing and long-term compactability testing would be required to develop the appropriate mixture of native soil, bentonite, and water for the slurry wall. This alternative would be implemented in conjunction with Soil Alternative S-8, which proposes an asphalt cap at IR-07.

ARARs are discussed in Section 2.7. Those requirements that are pertinent to this alternative are identified on Table 6.

The estimated present value of this alternative is $5,275,000. Implementation of this alternative is expected to last approximately 12 to 18 months for the baseline elements described in Alternative GW-2 and 6 to 9 months for construction of the slurry wall.

2.9 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section documents the comparative analysis conducted to evaluate the relative performance of each alternative in relation to the evaluation criteria. The NCP, 40 CFR Part 300.430(f), identifies nine criteria that must be considered to evaluate and select a remedy. Overall protection of human health and the environment and compliance with ARARs are the threshold criteria that must be satisfied for a remedy to be eligible for selection. Long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost are the primary balancing criteria used to weigh major trade-offs among the remedies. State and community acceptance are modifying criteria.

2.9.1 Soil Alternatives

Overall Protection of Human Health and the Environment: All of the alternatives, except Alternative S-1, no action, would protect human health and the environment by eliminating, reducing, or controlling site risks through a combination of treatment, engineering controls, or institutional controls. Alternatives S-2 and S-6 are most effective at eliminating risk because they will result in the removal of soil posing a potential cancer risk above 1×10^{-6}, to the extent practicable given analytical detection limits from Parcel B. Alternative S-8 relies primarily on on-site containment to reduce risks. Alternatives S-3, S-4, and S-6 incorporate treatment as part of the remedy.

Compliance with ARARs: The State asserts that the Basin Plan and Resolution No. 92-49 are chemical-specific ARARs for soil. As explained in Section 2.7, the Navy does not agree with the State. Nevertheless, both the State and the Navy agree that, by remediating soil to a health-based cleanup goal of 10^{-6} or less for carcinogens (as practicable given analytical detection limits), an HI of 1 or less for noncarcinogens (as practicable given analytical detection limits), a lead level of less than 221 mg/kg, or to ambient levels for certain metals, Alternative S-2 will achieve the objectives in the Basin Plan and Resolution No. 92-49. The other alternatives, except Alternative S-1, would also satisfy these objectives. All the alternatives would be implemented to meet their respective action-specific ARARs as set forth on Table 5. Location-specific ARARs would be met by determining whether the action is consistent with the coastal zone management plan.

Long-Term Effectiveness and Permanence: Alternative S-1 would provide no long-term effectiveness. Alternatives S-2 and S-6 provide the highest level of long-term effectiveness because all soil would be excavated, thereby leaving, to the extent possible, no residual risks greater than 10^{-6} or ambient levels at Parcel B. Alternatives S-3 and S-4 would provide the next highest level of long-term effectiveness by excavating soil containing SVOCs, inorganic compounds, and combined organic and inorganic compounds. Because VOCs would be treated in situ under these alternatives, the magnitude of residual risks would depend on the effectiveness of the SVE system. The long-term effectiveness of Alternative S-8 would depend on the effectiveness of the asphalt cap.

Reduction of Toxicity, Mobility, or Volume Through Treatment: Alternative S-1 will not reduce the toxicity, mobility, or volume of contaminated soil. Alternatives S-3 and S-4 use in situ SVE to reduce the toxicity and volume of VOCs. Alternative S-6 relies on ex situ thermal desorption to reduce the toxicity, mobility, and volume of VOCs as well as SVOCs and TPHs. Both Alternatives S-4 and S-6 reduce the mobility of inorganic compounds. Alternatives S-2 and S-8 do not involve, as a principal element, on-site treatment to reduce the toxicity, mobility, or volume of hazardous substances. However, if the concentrations in the excavated soil trigger hazardous waste land disposal restrictions, treatment at the landfill will be required prior to disposal.

Short-Term Effectiveness: Other than Alternative S-1, the alternatives involve significant excavation activities and therefore may generate dust emissions. The risk to the community is expected to be minimal from these dust-generating activities. The potential threat to workers is less with Alternatives S-3 and S-4; less demolition is required because SVE systems would be installed rather than soil excavated. All the alternatives would include dust- and emission-control measures and appropriate safety protocols to protect the community and workers during implementation. Impact to the environment during implementation is minimal under all of the alternatives.

Implementability: All of the alternatives are technically implementable. Equipment for excavation, as well as the various treatment technologies considered (SVE, thermal desorption, encapsulation and stabilization), are readily available. In addition, sufficient off-site landfill capacity is available for all the alternatives involving off-site disposal. Alternatives S-2, S-6, and S-8 may be slightly more difficult to implement than S-3 and S-4 because they require excavation under existing buildings. Alternatives S-3 through S-8 will require performance testing of the proposed treatment technologies. In terms of

administrative feasibility, Alternative S-2 is easiest to implement. Alternatives S-3, S-4, and S-6 all depend on the selection of a capping and containment remedy at the IR-1/21 landfill.

Cost: The estimated costs of the alternatives range from approximately $3,655,000 for Alternative S-8 to $15,853,000 for Alternative S-6. Alternatives S-2, S-3, and S-4 are fairly comparable in cost, ranging from $8,554,000 to $11,161,000.

State Acceptance: The State concurred that Alternative S-6 may be an appropriate remedy for Parcel B soil if logistical issues relating to coordinating this alternative with the remedy for the IR-1/21 landfill could be resolved. The State also supports Alternative S-2, off-site treatment and disposal.

Community Acceptance: During the public comment period, the public expressed concern about any alternatives (Alternatives S-3, S-4, and S-6) that relied on the use of treated soil as sub-base foundation material for the IR-1/21 landfill. Instead, the public indicated a preference for off-site treatment and disposal of contaminated soils.

2.9.2 Groundwater Alternatives

Overall Protection of Human Health and the Environment: Alternative GW-1 is not protective of human health and the environment. By imposing deed restrictions, Alternatives GW-2, GW-3, and GW-5 would prevent human exposure to contaminated groundwater. These alternatives would also protect the environment by removing preferential pathways for contaminated groundwater to discharge to the Bay; monitoring would be implemented to track potential migration. Alternatives G-3 and G-5 would provide additional short-term protection over GW-2 through extraction or containment of groundwater at IR-07. Alternative GW-2 relies on natural attenuation and dilution rather than extraction.

Compliance with ARARs: As explained in Section 2.7, there is disagreement between the Navy and the State as to whether certain State plans and resolutions, notably the Basin Plan, Resolution No. 68-16, and Resolution No. 92-49, are ARARs. The Navy and the State agree that Alternative GW-2, by removing source areas and monitoring to ensure that hazardous substances at concentrations above ambient levels for inorganic compounds or NAWQC/Basin Plan water quality objectives (whichever is lower) for organic compounds, are not entering the Bay, would meet the requirements of Resolution No. 68-16

regardless of whether it is an ARAR. Alternative GW-2 is also consistent with the Basin Plan and Resolution No. 92-49 in that it promotes the attainment of background water quality by removing source areas and thus protecting the only possible beneficial use of groundwater, which is freshwater replenishment. The Basin Plan provides that "[g]roundwaters with a beneficial use of freshwater replenishment shall not contain concentrations of chemicals which adversely affect the beneficial use of the receiving surface water." The beneficial uses of the San Francisco Bay include navigation, water contact and non-contact recreation, ocean commercial and sport fishing, and estuarine habitat. These beneficial uses will be maintained by removing the source of the contamination (that is, the contaminated soil). Residual pollution in soils at sites upgradient of the tidally influenced zone will attenuate to concentrations that will protect this possible beneficial use. Alternatives GW-3 and GW-5 would also satisfy these requirements. All the alternatives would be implemented to meet their respective action-specific ARARs as described on Table 6 and the location-specific ARARs described in Section 2.7.

Long-Term Effectiveness: Alternative GW-1 is not effective in the long term because it does not reduce or eliminate risks from contaminated groundwater. The other alternatives provide long-term protection through the use of deed restrictions to minimize potential human health risks. Alternatives GW-2, GW-3, and GW-5 also provide long-term protection to the environment by removing preferential pathways. Alternatives GW-3 and GW-5 may provide slightly greater long-term effectiveness in that they actively remove or contain contaminated groundwater; however, the long-term effectiveness of these alternatives depends on the efficiency of the extraction system and the cap/slurry wall.

Reduction of Toxicity, Mobility, or Volume Through Treatment: Alternative GW-1 will not reduce the toxicity, mobility, or volume of hazardous substances. Alternatives GW-3 and GW-5 reduce the volume, toxicity, and mobility of contaminated groundwater by extraction and treatment.

Short-Term Effectiveness: Because no action is taken under Alternative GW-1, it would pose no short-term risks to workers, the community, or the environment. Of the other three alternatives, Alternative GW-2 provides the greatest short-term effectiveness. Under all the alternatives, the potential risks to the community and workers are minimal and related largely to possible fugitive dust emissions. Alternatives GW-3 and GW-5 create greater risks to the community than Alternative GW-2 as a result of the greater volume of soil that would be disturbed. Potential risks to workers are minimal and would be

controlled through the use of appropriate safety protocols. Alternative GW-5 presents the greatest risk to workers because of the heavy construction required to install the slurry wall. Under GW-2, GW-3, and GW-5, short-term risks to the environment are minimal.

Implementability: Alternative GW-2 is technically and administratively implementable. Alternatives GW-3 and GW-5 would be more difficult to implement than Alternative GW-2. GW-3 and GW-5 both require placing an extraction system and obtaining a permit from the POTW to discharge contaminated groundwater. Because of potential difficulties associated with the construction of a slurry wall, GW-5 would be the most difficult alternative to implement.

Cost: Alternative GW-1, no action, involves no costs. The estimated capital and O&M costs for the other three alternatives is as follows: $3,622,000 for Alternative GW-2; $4,630,000 for Alternative GW-3, and $5,275,000 for Alternative GW-5.

State Acceptance: No action is unacceptable to the State. The State supports the selection of Alternative GW-2.

Community Acceptance: The community raised no objections to implementation of Alternative GW-2.

2.10 SELECTED REMEDY

Based on consideration of the requirements of CERCLA, the detailed analysis of alternatives, and public comments, the Navy, with the concurrence of EPA and the State of California, has determined that Alternative S-2 (Deed Notification, Excavation and Off-Site Disposal) and Alternative GW-2 (Deed Restrictions, Deed Notification, Storm Drain System Lining, Fuel Line and Steam Line Removal, and Groundwater Monitoring) are the most appropriate remedies for soil and groundwater, respectively, for Parcel B at HPS in San Francisco, California. The proposed schedule for implementing the remedy is set forth in Table 11.

TABLE 11

PROPOSED REMEDIAL DESIGN/REMEDIAL ACTION SCHEDULE

Task	Estimated Date*
Draft remedial design and remedial action (design drawings and performance specifications) work plans	August 14, 1997 (date submitted)
Final remedial design and remedial action work plans	February 14, 1998
Implementation of remedial action	June 15, 1998
Completion of construction for remedial action	June 15, 1999

* This schedule is estimated based on current information and is subject to modification based on changed conditions during RD/RA.

The goal of the soil response action is to control risks posed by the ingestion of or dermal contact with contaminated soils or inhalation of vapors and fugitive dusts containing hazardous substances. The proposed cleanup goals for soil remaining on Parcel B are based on reducing risks to future residents to an ELCR of 10^{-6} and an HI of 1 or, for certain metals, to ambient concentrations. However, in some instances, these concentrations are below analytical detection limits and therefore, for those substances, the cleanup goal is the detection limit. The chemical-specific cleanup goals are listed in Table 8.

Approximately 38,000 cubic yards of soil will be excavated from areas throughout Parcel B (Figure 5). Section A-1 of IR-6 remaining from the removal action will also be remediated to groundwater. Excavated soil will be stockpiled within the area of contamination without triggering land disposal restrictions. Controls will be instituted to eliminate surface run-on and runoff while the soil is stockpiled. The excavated soil will be sampled and characterized. Soil that contains listed hazardous waste or that exhibits hazardous waste characteristics will be placed in containers for shipment off site; soil that does not require management as a hazardous waste may be moved to a central stockpile location on HPS prior to shipment off site. The soil will be shipped off site either by rail cars or by trucks. A notification will be placed on the deed indicating that soil below the groundwater table in the remediated areas as specified in the remedial action close-out report may be contaminated. All future soils excavated from

SAN FRANCISCO BAY

IR-07
IR-18
IR-23
IR-60
IR-61
IR-62
IR-24
IR-10
IR-20
IR-26
SI-31
IR-42
IR-06

LEGEND

- IR SITE BOUNDARIES
- PARCEL B BOUNDARY
- SOIL EXCAVATION AREAS
- COMPLETED SOIL REMOVAL ACTION AREAS (IT CORPORATION, SEPTEMBER 29, 1997)

250 0 125 250
SCALE IN FEET

DEPARTMENT OF THE NAVY — NAVAL ACTIVITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY WEST
SAN BRUNO, CALIFORNIA
HUNTERS POINT SHIPYARD — SAN FRANCISCO, CALIFORNIA

FIGURE 5
PARCEL B
SOIL EXCAVATION AREAS

Code: /data3/hunters/ams/parc_b/riskgrid_combo5.mxd AML
/data3/hunters/ams/parc_b/riskgrid_combo5.map
10/03/97

below the groundwater table in remediated areas must be managed as potential hazardous waste. In addition, any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals presented in Table 8 of this ROD will be restricted from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone. The ARARs for this action are listed on Table 5. Alternative S-2 was selected over the other alternatives because it provides the best balance of the nine NCP criteria. It will provide overall protection to human health and the environment by reducing the residual soil risks on Parcel B to below an ELCR of 10^{-6} and an HI of 1.0, or to ambient concentrations. Alternative S-2 is widely supported by the community, is more cost-effective than most of the other alternatives, and is easily implemented within a short time frame.

For groundwater, the objective of the response action is to prevent groundwater containing hazardous substances from migrating to the Bay at concentrations that may pose a threat to aquatic receptors. Alternative GW-2 (Deed Restrictions, Deed Notification, Storm Drain System Lining, Fuel Line and Steam Line Removal, and Groundwater Monitoring) achieves this objective by removing preferential groundwater pathways, such as the sewer lines, soil source removal at IR-07, where soil will be removed to the groundwater table, and monitoring, and deed notification indicating that contamination may be present in the groundwater in the remediated areas as specified in the remedial action close-out report. All resurfaced groundwater will be managed in accordance with federal, State and local laws and requirements including local ordinances such as Articles 4.1 and 20 of the San Francisco Public Works Code. Surface discharge of contaminated groundwater is prohibited. Groundwater at IR-10 shall be monitored to track the potential degradation of TCE to vinyl chloride. Should the levels of vinyl chloride increase, the Navy will activate the groundwater contingency measures. The ARARs for this action are identified on Table 6.

The Navy shall monitor the groundwater to ensure that the NAWQC and the ambient concentrations for metals are not exceeded at the high tide line of the Parcel B tidally-influenced zone which is the point of compliance. Groundwater sentinel monitoring wells will be located to ensure contaminants posing potential ecological threats from all possible Parcel B sites and sources will be tracked and evaluated, and to monitor any migration at the parcel boundary along IR-07 and IR-18. Data from the B-aquifer will be collected to assist in developing the monitoring program. A groundwater monitoring plan that uses a 5-

year buffer zone upgradient of the tidally influence zone will be instituted. A series of sentinel wells will be located upgradient from the point of compliance a distance equivalent to a groundwater travel time of 5 years. A schematic of the groundwater monitoring plan is shown in Figure 6. The sentinel well monitoring locations and monitoring program will be presented in the Parcel B Groundwater Contingency Plan that will be prepared during the remedial design. The Navy shall monitor the groundwater to ensure that 10 times NAWQC or Basin Plan criteria (whichever is higher) for organic compounds and ambient groundwater concentrations of metals are not exceeded at the sentinel wells. The groundwater monitoring trigger levels presented in Table 10 will be used for the monitoring well results. As default criteria, the Navy will undertake the following actions if groundwater monitoring data exceed the above criteria:

- Orally notify the regulatory agencies within 15 days of any exceedance of the groundwater monitoring criteria
- Consult with the regulatory agencies regarding the exceedance
- Conduct monitoring to verify the exceedance in accordance with the monitoring plan (which will be developed during the remedial design/remedial action phase)
- At the written request of one or more of the regulatory agencies, the Navy will develop a proposal as to what should be done to address the exceedance, which may result in a change in the remedy
- The change may require a ROD amendment depending on the significance of the change. Any changes to the remedy will be addressed and presented to the public in accordance with CERCLA
- After the RD, the Federal Facilities Agreement (FFA) shall continue to apply through operation and maintenance of the Parcel B response action.

During the RD phase, the Navy will develop the groundwater monitoring program parameters. Although groundwater monitoring may be conducted for up to 30 years, the monitoring plan, including the analyses conducted, the sampling frequency, and the overall length of the monitoring program, will be re-evaluated after 5 years of monitoring. In addition, during RD, the Navy will develop a groundwater model to calculate a site-specific multiplier to be applied to the NAWQC/Basin Plan water quality objectives and ambient metal concentration to reflect the expected dilution attenuation that is likely to occur as contamination migrates from the monitoring well to the Bay. Once these site-specific criteria

SAN FRANCISCO BAY

EDGE OF TIDALLY INFLUENCED ZONE (POINT OF COMPLIANCE)

FIVE YEAR BUFFER ZONE

IR-07

IR-18

IR-23

IR-61

IR-60

IR-62

IR-10

IR-24

IR-25

IR-20

IR-26

IR-42

IR-06

SI-31

BERTH 64

BERTH 63

BERTH 62

DRY DOCK 7

DRY DOCK 6

DRY DOCK 5

BERTH 61

BERTH 58

BERTH 57

BERTH 56

BERTH 55

104 116 117 103 120 113 108 110 111 112 121 122 123 125 128 130 133 134 140 141 144 145 146 S-146 156 157 159

LEGEND

- SENTINEL WELL FOR IR-10
- SENTINEL WELL FOR IR-25 IN PARCEL C
- SENTINEL WELL TO EVALUATE OFF-SITE MIGRATION IR-07 AND IR-18
- POINT OF COMPLIANCE MONITORING WELL FOR IR-06, IR-10 AND IR-25
- *POST REMEDIAL ACTION MONITORING WELL* TO EVALUATE EFFECTIVENESS OF SOURCE ACTION AT IR-07
- TIDAL INFLUENCE ZONE
- FIVE YEAR BUFFER ZONE
- NICKEL DETECTED IN GROUNDWATER AT CONCENTRATIONS EXCEEDING HGAL
- TRICHLOROETHELENE DETECTED IN GROUNDWATER AT IR-10
- 104 EXISTING BUILDING
- PARCEL BOUNDARY
- IR SITE BOUNDARY
- RAILROAD TRACK

125 0 125 250
SCALE IN FEET

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY WEST
SAN BRUNO, CALIFORNIA
HUNTERS POINT SHIPYARD — SAN FRANCISCO, CALIFORNIA

FIGURE 6
GROUNDWATER MONITORING
PLAN SCHEMATIC
PARCEL B RECORD OF DECISION

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are developed, they will replace the 10 times default criteria as the trigger for taking any groundwater action.

While part of the groundwater monitoring plan is to deploy a series of sentinel wells with 5-year buffer zone to provide an early warning system, the Navy and the regulatory agencies recognize there are contaminants (specifically, nickel) in the vicinity of IR-7 that have already exceeded cleanup criteria in the buffer zone. It is agreed that groundwater in the area will be closely monitored while the source removal (soil excavation in the contaminated area) is implemented. If monitoring data indicates the source removal does not effectively reduce the contamination in groundwater, the groundwater contingency plan will take effect.

To minimize any potential migration off site onto IR-07 and IR-18, the sheet piling installed to shore the area for excavation will remain in place after the excavation is completed. A restriction shall be placed on the Parcel B deed requiring the following:

- Prohibiting all use and consumption of Parcel B groundwater in the shallow water bearing zone(s) to 90 feet below ground surface;
- prohibiting surface discharge of contaminated groundwater;
- notifying all future owners of Parcel B that contamination may be present in the groundwater and in the soils below the groundwater table in the remediated areas as specified in the remedial action close-out report;
- notifying all future owners that the Parcel B storm drains are lined;
- requiring all future owners to indicate, in writing, to all tenants on Parcel B that contamination may be present in the groundwater and in the soils below the groundwater table in the remediated areas as specified in the remedial action close-out report, and that the storm drains are lined;
- requiring all future owners and tenants of Parcel B, which excavate soils and surface groundwater from below the groundwater table in remediated areas as specified in the remedial action close-out report, that contamination may be present and must be managed in accordance with federal, State and local laws and requirements including local ordinances such as Articles 4.1 and 20 of the San Francisco Public Works Code; and

- requiring any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals presented in Table 8 of this ROD will be restricted from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone.

An appendix to the Parcel B Remedial Design, a primary deliverable under the FFA, shall detail how the institutional controls outlined above shall be implemented and enforced.

2.11 STATUTORY DETERMINATIONS

As required under Section 121 of CERCLA, the selected remedial action is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate, and is cost effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, it does not satisfy the statutory preference for remedies that employ treatment to reduce toxicity, mobility, and volume as a principal element. This is due to numerous comments received during the public comment period voicing strong opposition to on-site treatment and disposal, the alternative initially proposed by the Navy for the Parcel B contaminated soils. In response to community concerns, the Navy has selected excavation and off-site disposal for the Parcel B contaminated soils. Furthermore, because this remedy will result in hazardous substances remaining on site above health-based levels, the Navy shall conduct a review pursuant to CERCLA Section 121, 42 USC Section 9621, at least once every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection to human health and the environment. For groundwater, deed restrictions will limit human exposure to groundwater. Removal of preferential pathways and soil excavation combined with groundwater monitoring will provide environmental protection.

2.12 DOCUMENTATION OF SIGNIFICANT CHANGES

The proposed plan for Parcel B was released for public comment in October 1996. The Navy, EPA, and the State of California reviewed all written and oral public comments submitted during the public comment period on the proposed plan. Upon review of these comments, the Navy has selected a different alternative for soil. The preferred groundwater alternative has also been modified as a result of re-defining the Parcel B and Parcel C boundary and incorporating IR-25 into Parcel C.

The preferred soil alternative identified in the proposed plan was Alternative S-6 (Excavation, Treatment by Thermal Desorption and/or Solidification/Stabilization as Necessary, and Use as Cap Foundation Material at the IR-1/21 Landfill or Off-Site Disposal). Implementation of Alternative S-6 was contingent on selection of a capping and containment remedy at the IR-1/21 landfill in Parcel E. In the proposed plan, the Navy proposed Alternative S-2 (Excavation and Off-Site Disposal) as an alternative remedy in the event that capping and containment at IR-1/21 was not selected or the treated soils could not be used as sub-base foundation material. During the public comment period, significant concerns were voiced by community members concerning the relationship of the remedy for Parcel B to the remedy for the IR-1/21 landfill at Parcel E. In addition, new information became available on the relative costs to dispose of contaminated soils off site. For these reasons, the Navy has chosen, in this ROD, to select Alternative S-2 as the final soil remedy for Parcel B.

At IR-10, in light of concerns about the potential degradation of TCE and the potential of the degraded compounds to offgas into the soil and into buildings, the Navy has decided to implement a safety plan to address this concern. This concern will be addressed in the groundwater monitoring plan, and it will include groundwater sampling at IR-10 for TCE and its degradation compounds.

In addition, because of concerns regarding DNAPLs at IR-25, the Navy has decided to evaluate and consider additional remedial alternatives for IR-25. Consequently, remedial alternatives to address the contamination at IR-25 will be considered in the Parcel C FS and a remedy selected as part of the Parcel C ROD. Thus, the groundwater remedy as originally proposed has been modified only in that those components of the remedy designed to address conditions at IR-25 have not been selected under this ROD.

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APPENDIX A

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-06	Soil	Arsenic	0.31 - 56.6 mg/kg
		Beryllium	0.18 - 0.91 mg/kg
		Chromium	40.0 - 1,910 mg/kg
		Lead	0.67 - 2,580 mg/kg
		Manganese	169 - 4,640 mg/kg
		Nickel	21.7 - 3,390 mg/kg
		Benzo(a)anthracene	87 - 830 µg/kg
		Benzo(a)pyrene	91 - 1,300 µg/kg
		Benzo(b)fluoranthene	41 - 2,500 µg/kg
		Benzo(k)fluoranthene	95 - 2,500 µg/kg
		Dibenzo(a,h)anthracene	60 - 84 µg/kg
		Aldrin	12 - 130 µg/kg
		Aroclor-1260	77 - 150,000 µg/kg
		TPH-d	9 - 26,000 mg/kg
	Groundwater	Cadmium	3.0 - 6.4 µg/L
		Copper	1.6 - 58.2 µg/L
		Manganese	26.8 - 8,860 µg/L
		Nickel	13.6 - 117 µg/L
		1,2-DCA	5 - 1 µg/L[b]
		1,2-DCE (total)	5 - 130 µg/L
		Benzene	5 - 72 µg/L
		Chloroform	4 - 24 µg/L
		cis-1,2-DCE	3 - 340 µg/L
		Methylene chloride	5 - 17 µg/L
		Vinyl chloride	5 - 62 µg/L
		1,4-Dichlorobenzene	10 - 5 µg/L[b]
		Bis(2-ethylhexyl) phthalate	10 - 20 µg/L
		Carbazole	20 - 53 µg/L
		Naphthalene	28 - 1,700 µg/L
		Pentachlorophenol	50 - 3 µg/L[b]
		Phenanthrene	17 - 160 µg/L
		TPH-d	430 - 11,000 µg/L
		TPH-mo	170 - 3,100 µg/L
		TPH-extractables (unknown hydrocarbons)	630 - 7,300 µg/L
		TOG	800 - 6,000 µg/L

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA (Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-06	Groundwater (Continued)	TRPH	1,000 - 800 µg/L[b]
IR-07	Soil	Arsenic	0.56 - 929 mg/kg
		Beryllium	0.05 - 1.7 mg/kg
		Copper	2.7 - 2,540 mg/kg
		Lead	0.72 - 5,120 mg/kg
		Manganese	47.6 - 8,490 mg/kg
		Nickel	24.6 - 3,550 mg/kg
		Benzo(a)anthracene	37 - 1,500 µg/kg
		Benzo(a)pyrene	41 - 980 µg/kg
		Benzo(b)fluoranthene	37 - 1,100 µg/kg
		Dibenzo(a,h)anthracene	37 - 91 µg/kg
		Aroclor-1260	62 - 340 µg/kg
		TPH-d	12 - 4,200 mg/kg
		TOG	33 - 27,000 mg/kg
	Groundwater	Antimony	29.7 - 44.1 µg/L
		Barium	22.4 - 1,320 µg/L
		Cadmium	2.7 - 5.6 µg/L
		Chromium	3.8 - 1,260 µg/L
		Copper	2.0 - 40.6 µg/L
		Nickel	14.9 - 7,120 µg/L
		Thallium	2.7 - 28.1 µg/L
		PCA	5 - 1 µg/L[b]
		Benzene	5 - 2 µg/L[b]
		PCE	5 - 2 µg/L[b]
IR-10	Soil	Lead	1.2 - 777 mg/kg
		Nickel	6.1 - 2,440 mg/kg
		TCE	1 - 980,000 µg/kg
		Benzo(a)anthracene	48 - 1,100 µg/kg
		Benzo(a)pyrene	39 - 1,300 µg/kg
		Benzo(b)fluoranthene	54 - 1,400 µg/kg
		Benzo(k)fluoranthene	38 - 1,400 µg/kg
		Dibenzo(a,h)anthracene	75 - 75 µg/kg
	Groundwater	Antimony	10.1 - 46.6 µg/L
		Beryllium	0.41 - 1.4 µg/L
		Chromium	1.6 - 1,140 µg/L

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA (Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-10	Groundwater (Continued)	Chromium VI	50.0 - 1,680 µg/L
		Copper	1.8 - 39.5 µg/L
		Silver	6.9 - 20.7 µg/L
		1,2-DCE	3 - 66 µg/L
		Chloroform	2 - 0.8 µg/L[b]
		cis-1,2-DCE	1 - 15 µg/L
		TCE	2 - 45µg/L
		Vinyl chloride	4 - 3 µg/L[b]
		Bis(2-ethylhexyl)-phthalate	18 - 120 µg/L
		2,6-Dinitrotoluene	25 - 58 µg/L
		TPH-d	100 - 160 µg/L
		TPH-mo	100 - 820 µg/L
IR-18	Soil	Arsenic	0.85 - 11.4 mg/kg
		Beryllium	0.04 - 0.92 mg/kg
		Chromium	14.1 - 2,110 mg/kg
		Lead	0.93 - 2,380 mg/kg
		Manganese	93.7 - 2,370 mg/kg
		Nickel	19.1 - 3,670 mg/kg
		Benzo(a)anthracene	13 - 10,000 µg/kg
		Benzo(a)pyrene	34 - 8,600 µg/kg
		Benzo(b)fluoranthene	33 - 8,700 µg/kg
		Benzo(k)fluoranthene	33 - 5,600 µg/kg
		Chrysene	17 - 12,000 µg/kg
		Dibenzo(a,h)anthracene	95 - 1,200 µg/kg
		Indeno(1,2,3-cd)pyrene	51 - 4,000 µg/kg
		Aroclor-1260	31 - 3,400 µg/kg
		Aroclor-1254	45 - 12,000 µg/kg
		TPH-d	11 - 1,100 mg/kg
		TPH-mo	7 - 25,000 mg/kg
		TRPH	3 - 14,000 mg/kg
	Groundwater	Silver	8.8 - 8.8 µg/L
		Thallium	2.8 - 30.7 µg/L
		TPH-mo	100 - 740 µg/L
IR-20	Soil	Arsenic	0.82 - 11.2 mg/kg
		Beryllium	0.17 - 1.3 mg/kg

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA (Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-20	Soil (Continued)	Chromium III	11.2 - 2,990 mg/kg
		Chromium VI	0.11 - 1.1 mg/kg
		Lead	2.1 - 578 mg/kg
		Manganese	143 - 14,100 mg/kg
		Nickel	3.0 - 5,580 mg/kg
		Benzo(a)pyrene	140 - 140 µg/kg
		Aroclor-1260	21 - 3,100 µg/kg
		TPH-g	2 - 590 mg/kg
		TPH-d	12 - 3,400 mg/kg
	Groundwater	Barium	66.0 - 1,020 µg/L
		Lead	1.4 - 67.2 µg/l
		Mercury	0.17 - 2.0 µg/l
		Nickel	27.9 - 122 µg/l
		Thallium	1.8 - 16.5 µg/L
		Zinc	18.2 - 2,580 µg/l
		Benzene	10 - 10 µg/L
		TPH-g	50 - 190 µg/L
		TPH-d	100 -150 µg/L
		TPH-mo	100 -560 µg/L
		TOG	5,000 - 3,800 µg/L[b]
IR-23	Soil	Arsenic	0.86 - 22.8 mg/kg
		Beryllium	0.05 - 3.2 mg/kg
		Chromium	19.9 - 1,330 mg/kg
		Lead	0.33 - 1,080 mg/kg
		Manganese	292 - 2,350 mg/kg
		Nickel	54.9 - 2,050 mg/kg
		Vanadium	6.5 - 1,960 mg/kg
		Benzo(a)anthracene	48 -14,000 µg/kg
		Benzo(a)pyrene	38 - 21,000 µg/kg
		Benzo(b)fluoranthene	100 - 16,000 µg/kg
		Benzo(k)fluoranthene	54 - 11,000 µg/kg
		Chrysene	81 - 14,000 µg/kg
		Dibenzo(a,h)anthracene	930 - 930 µg/kg
		Indeno(1,2,3-cd)pyrene	53 - 12,000 µg/kg
		4,4N-DDT	11 - 2,800 µg/kg
		Aroclor-1260	67 - 560 µg/kg

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA
(Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-23	Soil (Continued)	TPH-mo	6 - 2,600 mg/kg
		TRPH	4 - 3,100 mg/kg
	Groundwater	Bis(2-ethylhexyl) phthalate	4 - 31 µg/L
		TPH-mo	100 - 1,100 µg/L
		TRPH	1,000 - 800 µg/L[b]
IR-24	Soil	Arsenic	0.51 - 12.1 mg/kg
		Lead	0.42 - 165 mg/kg
		Manganese	126 - 7,320 mg/kg
		Nickel	12.9 - 2,310 mg/kg
		TCE	3 - 6,300 µg/kg
		Chrysene	290 - 7,800 µg/kg
		Aroclor-1260	45 - 1,400 µg/kg
		TPH-g	1 - 920 mg/kg
		TPH-d	24 - 13,000 mg/kg
		TRPH	16 - 5,300 mg/kg
	Groundwater	Cadmium	1.6 - 13.5 µg/l
		Copper	28.7 - 28.7 µg/l
		Lead	11.0 - 15.2 µg/L
		Carbon Disulfide	30 - 66 µg/L
		TPH-g	310 - 800 µg/L
		TPH-purgeable unknown hydrocarbons	1,000 - 2,800,000 µg/L
		TPH-d	1,000 - 66,000 µg/L
		TPH-mo	810 - 8,700 µg/L
		TRPH	1,300 - 4,900 µg/L
		TOG	5,000 - 9,500 µg/L
IR-26	Soil	TRPH	5,000 - 63,000,000 µg/L
		Arsenic	0.36 - 915 mg/kg
		Beryllium	0.02 - 1.0 mg/kg
		Chromium	19.1 - 1,430 mg/kg
		Lead	0.80 - 3,340 mg/kg
		Manganese	106 - 11,200 mg/kg
		Mercury	0.05 - 316 mg/kg
		Nickel	19.1 - 2,940 mg/kg
		TCE	3 - 21,000 µg/kg
		Benzo(a)anthracene	54 - 7,000 µg/kg
		Benzo(a)pyrene	64 - 6,800 µg/kg

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA (Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-26	Soil (Continued)	Benzo(b)fluoranthene	60 - 7,000 µg/kg
		Benzo(k)fluoranthene	31 - 5,700 µg/kg
		Chrysene	63 - 8,100 µg/kg
		Dibenzo(a,h)anthracene	32 - 1,700 µg/kg
		Indeno(1,2,3-cd)pyrene	47 - 3,800 µg/kg
		Aroclor-1260	10 - 1,500 µg/kg
		TPH-mo	6 - 9,100 mg/kg
		TRPH	3 - 26,000 mg/kg
	Groundwater	Cadmium	0.20 - 6.2 µg/L
		Nickel	18.0 - 116 µg/L
		Zinc	1.9 - 145 µg/L
		2,4,6-trichlorophenol	10 - 24 µg/L
		heptachlor epoxide	0.01 - 0.013 µg/L
		TPH-d	100 - 320 µg/L
		TPH-mo	100 - 790 µg/L
		TRPH	900 - 1,000 µg/L[b]
SI-31	No contaminated media		
IR-42	Soil	Barium	60.4 - 476 mg/kg
		Chromium	83.9 - 540 mg/kg
		Lead	4.0 - 139 mg/kg
		Manganese	176 - 2,640 mg/kg
		Nickel	56.8 - 765 mg/kg
SI-45	Steam line system water	1,1-DCE	7 - 7 µg/L
		Benzene	41 - 41 µg/L
		Trichloroethene	9 - 9 µg/L
		Xylenes	260 - 260 µg/L
IR-46	Soil	Antimony	0.76 - 61.2 mg/kg
		Arsenic	0.49 - 13.9 mg/kg
		Beryllium	0.04 - 0.84 mg/kg
		Chromium	9.4 - 1,480 mg/kg
		Lead	0.81 - 251 mg/kg
		Manganese	43.1 - 13,700 mg/kg
		Nickel	8.5 - 6,480 mg/kg
		Benzo(a)pyrene	36 - 1,200 µg/kg
		Benzo(k)fluoranthene	23 - 810 µg/kg
		Dibenzo(a,h)anthracene	26 - 330 µg/kg

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA
(Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-46	Soils (Continued)	Benzo(a)anthracene	24 - 1,500 µg/kg
		Benzo(b)fluoranthene	32 - 1,300 µg/kg
		Indeno(1,2,3-cd)pyrene	61 - 900 µg/kg
		Aroclor-1260	17 - 26,000 µg/kg
		TPH-d	6 - 6,500 mg/kg
		TPH-mo	6 - 9,700 mg/kg
		TRPH	3 - 18,000 mg/kg
		TPH-g	0.6 - 2,200 mg/kg
		TPH-Not determined purgeable hydrocarbon	57 - 1,500 mg/kg
	Groundwater	Cadmium	0.36 - 16.5 µg/L
		Thallium	2.8 - 13.6 µg/L
		Bis(2-ethylhexyl)-phthalate	8 - 34 µg/L
		2,6-Dinitrotoluene	25 - 100 µg/L
		TPH-g	50 - 220 µg/L
		TPH-d	150 - 14,000 µg/L
		TPH-mo	130 - 1,300 µg/L
		TRPH	1,500 - 10,000 µg/L
IR-50	Storm drain system sediment	Antimony	5.1 - 258 mg/kg
		Arsenic	3.9 - 20.6 mg/kg
		Cadmium	0.54 - 20.9 mg/kg
		Chromium	66.6 - 444 mg/kg
		Lead	195 - 3,190 mg/kg
		Nickel	46.3 - 412 mg/kg
		Benzo(a)anthracene	84 - 12,000 µg/kg
		Benzo(b)fluoranthene	220 - 5,600 µg/kg
		Benzo(a)pyrene	320 - 320 µg/kg
		Chrysene	210 - 21,000 µg/kg
		Aroclor-1242	300 - 300 µg/kg
		Aroclor-1260	150 - 39,000 µg/kg
		TPH-d	180 - 2,300 mg/kg
		TRPH	86 - 6,000 mg/kg
IR-50	Test-pit soil near storm drain system	Chromium	277 - 694 mg/kg
		Manganese	1,240 - 3,360 mg/kg
		Benzo(a) pyrene	120 -120 µg/kg
		TPH-d	3,100 - 3,100 mg/kg

SUMMARY OF HAZARDOUS SUBSTANCES EXCEEDING SCREENING CRITERIA (Continued)

Site	Impacted Medium	Hazardous Substance Exceeding Screening Criteria[a]	Concentration Range
IR-50	Groundwater near sanitary sewer system	Mercury	0.14 - 0.91 µg/L
		TPH-mo	100 - 250 µg/L
IR-51	Soil	Aroclor-1260	35 - 15,000 µg/kg
IR-60	Soil	Arsenic	0.74 - 21.1 mg/kg
		Beryllium	0.02 - 0.73 mg/kg
		Lead	3.6 - 859 mg/kg
		Manganese	157 - 2,880 mg/kg
		Benzo(a)pyrene	180 - 620 µg/kg
		Benzo(b)fluoranthene	27 - 650 µg/kg
		TPH-mo	6 - 1,400 mg/kg
		TRPH	12 - 4,300 mg/kg
	Groundwater	Cadmium	0.36 - 31.7 µg/L
		TPH-mo	100 - 320 µg/L
IR-61	Soil	Arsenic	0.82 - 15.6 mg/kg
		Aroclor-1260	110 - 250 µg/kg
		TRPH	12 - 2,300 mg/kg
	Groundwater	TPH-mo	100 - 210 µg/L
IR-62	Soil	Chromium	57.3 - 1,480 mg/kg
		Nickel	86.2 - 2,530 mg/kg
		TPH-g	89 - 5,100 mg/kg
		TPH-d	8 - 9,700 mg/kg
		TRPH	3 - 13,000 mg/kg
	Groundwater	Hexachloroethane	5 - 10 µg/L
		TPH-g	750 - 8,700 µg/L
		TPH-d	340 - 35,000 µg/L
		TPH-mo	180 - 1,300 µg/L
		TRPH	1,100 - 23,000 µg/L

Note:

a The hazardous substances listed exceed EPA Region IX residential preliminary remediation goals (PRG) or ambient levels for soil; or EPA Region IX residential PRGs or National Ambient Water Quality Criteria and groundwater ambient levels.

b Value detected is based on single detection. The first value is the detection limit and the second value is the concentration detected.

APPENDIX B

RESPONSIVENESS SUMMARY FOR PARCEL B PROPOSED PLAN HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

CONTENTS

1.0 OVERVIEW

In October 1996, the Navy's "Draft Final Proposed Plan For Hunters Point Shipyard Parcel B" was prepared and presented to the public to describe the proposed cleanup alternatives for Parcel B, located within Hunters Point Shipyard (HPS), San Francisco, California. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that a responsiveness summary detailing community comments on the Navy's proposed cleanup alternative as presented in the proposed plan and the Navy's response to those comments be prepared following the public comment period. This document has been prepared to fulfill that requirement.

The proposed plan presented six cleanup options for soil and four cleanup options for groundwater in Parcel B. The preferred soil cleanup alternative presented in the proposed plan involves excavating the soils and treating them on site through a heating process called thermal desorption to remove volatile organic compounds (VOC), as well as, solidification and stabilization treatment to address metal contaminants. Treated soils would then be used as subbase foundation material for a landfill cap for Site IR- 1/21, in Parcel E. The preferred groundwater cleanup alternative presented in the proposed plan included a combination of deed restrictions prohibiting groundwater use, removal of steam and fuel lines, lining portions of the storm drain system to prevent groundwater from entering the system and San Francisco Bay, and long-term monitoring of the groundwater.

A public comment period was held from October 24, 1996, to December 26, 1996. In response to community requests for an extension, the comment period was extended 30 days beyond the initial public comment deadline of November 25. A public meeting was held to present the proposed plan and receive public comment on November 13, 1996. Written comments were also received from several organizations.

Largely because of comments received by the community on the proposed plan, the Navy has selected a different cleanup plan for soil within Parcel B. The groundwater cleanup plan remains the same as the preferred alternative presented in the proposed plan, with the exception of transferring IR-25 to Parcel C. The Navy and regulators are still discussing how to address groundwater contaminated with solvents beneath the machine shop at IR-25. Therefore, to allow more time to address groundwater issues at IR-25 and avoid delays in the cleanup and reuse of Parcel B, the Navy and the regulators decided to transfer IR-25 to Parcel C. Groundwater and soil issues at IR-25 will be addressed as part of the proposed

cleanup plan for Parcel C. The selected cleanup plan for Parcel B is described in the record of decision. In brief, the selected cleanup plan for soil includes excavating the contaminated soils and transporting them to off-site facilities for treatment and disposal.

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT

The Navy has been conducting an active community involvement program at HPS since 1987 and has initiated a wide range of activities. Numerous open houses, public meetings, and community workshops have been held to explain the environmental cleanup process, discuss possible job opportunities, and solicit community input on the Navy's approach to performing the cleanup at HPS. Fact sheets have been sent to a community mailing list, including elected officials, community organizations and interest groups, residents, and local businesses.

A community relations plan (CRP) was prepared in 1989 and recently updated in December 1996. The CRP presents an outreach program to inform and involve the community in the cleanup decision-making process. Two information repositories have been established to provide public access to detailed information regarding environmental cleanup activities at HPS. The two repositories are located in the San Francisco Main Library at the Civic Center, and the Anna E Waden Library, located at 5075 Third Street, San Francisco. Additionally, an HPS administrative record, which includes documentation to support the final cleanup decision, is located at the Naval Facilities Engineering Command in San Bruno, California, and is available for public review.

The Navy has also established a restoration advisory board (RAB) composed of community members to provide a forum for ongoing dialogue between the Navy, regulatory agencies, and the community on environmental cleanup issues at HPS. The RAB includes a wide range of community members. The goal of the RAB is to advise the Navy on its cleanup approach and review and comment on environmental cleanup documents. RAB meetings are held monthly and provide an opportunity for ongoing discussion between the Navy, regulators, and the community on cleanup activities underway at HPS.

3.0 PUBLIC COMMENTS AND NAVY RESPONSES

This section presents comments and questions received during the public comment period, as well as the Navy's responses to those comments. The comments addressed in Sections 3.1 were received during the public meeting (Section 3.1); comments addressed in Section 3.2 through 3.7 reflect written comments received from representatives from the City and County of San Francisco (Section 3.2), the Coalition for Better Wastewater Solutions (Section 3.3), the Innes Avenue Coalition (Section 3.4), ARC Ecology (Section 3.5), Supervisor Leslie Katz (Section 3.6), and ECDC Environmental (Section 3.7).

The majority of comments received during the public comment period indicate significant community concern regarding the use of the Parcel E landfill (IR-1/21) as part of the proposed remedy. Most community members appear to support off-site disposal of Parcel B soils rather than the treatment of soils and the use of treated soils as a cap for the IR-1/21 landfill.

Additional comments raised by several community members during the public meeting reflect concerns about (1) possible impacts of HPS contaminants on bay fisheries and (2) the effectiveness of thermal desorption as a treatment alternative. Other comments raised by individuals included concerns about health risks associated with the groundwater, contracting procedures, transport of wastes associated with implementation of the selected cleanup plan, and noise.

3.1 COMMENTS AND QUESTIONS FROM PUBLIC MEETING ON PARCEL B PROPOSED PLAN, NOVEMBER 13, 1996

The following summary reflects comments and questions raised during the public meeting that was conducted by the Navy on November 13, 1996. The purpose of the public meeting was to (1) present the proposed plan for Parcel B to the community, (2) respond to questions, (3) and receive community comments on the proposed plan. Several comments and questions raised during the public meeting do not directly relate to the Parcel B cleanup plan; nevertheless, those comments are also included. All of the following comments are summarized and do not present statements verbatim. Similar comments and questions raised by several individual community members are summarized as one comment.

3.1.1 IR-1/21 Landfill in Parcel E

1. **Comment:** **Several community members raised questions regarding plans to address contaminated groundwater from the IR-1/21 landfill in Parcel E and whether the contaminated groundwater will be pumped into the City of San Francisco's sanitary sewage system or stored on site. There appeared to be a perception that the City's sewage system was connected to the HPS storm water system.**

   Response: These questions refer to a removal action currently underway at Parcel E that is separate from the cleanup plan selected for Parcel B. The Parcel E removal action involves installing an underground sheet piling wall to contain contaminated groundwater from the landfill and prevent the groundwater from migrating to the San Francisco Bay. Contaminated groundwater will not be pumped into the city sewage system. It is important to note that the Navy's storm water system is completely separate from the City of San Francisco's sanitary sewage system.

   Within Parcel B, groundwater beneath the machine shop at IR-25 is contaminated with solvents; however, the Navy and regulators are still discussing how to address groundwater issues at IR-25. To allow more time to develop the most effective means to address these groundwater issues without slowing the cleanup and eventual reuse of Parcel B, the Navy and the regulators decided to transfer IR-25 from Parcel B to Parcel C. Groundwater contamination and any associated soil contamination beneath IR-25 will be addressed as part of the proposed plan to cleanup Parcel C.

2. **Comment:** **A question was raised regarding the percentage of treated soil from Parcel B that will be placed in the Parcel E landfill.**

   Response: The Navy's initial proposed cleanup plan for Parcel B involved using treated soils from Parcel B as subbase foundation material for the Parcel E landfill cap. If this plan is implemented, initial estimates indicated that approximately 80 percent of soil from Parcel B would have been used at the landfill following treatment. In light of community concern, however, the Navy's selected remedy does not include any use of the Parcel E landfill; instead, soils will be shipped to off-site treatment and disposal facilities. No percentage of treated soil from Parcel B will be placed in Parcel E.

3. **Comment** **One community member asked what permitting process is required for the Parcel E landfill and how long the landfill will exist. This person also asked what the cost differential is between cleaning, treating, and putting the Parcel B soils in the landfill and cleaning, treating, and removing the soil off site.**

   Response: The Parcel E landfill is not an active landfill; therefore, no operating permit is required. Furthermore, under CERCLA, permits are not required for on-site cleanup actions. Finally, the life of the Parcel E landfill will depend on the cleanup remedy selected for the landfill; a proposed cleanup remedy for the landfill is expected to be presented to the public in December 1997.

The estimated cost to treat the soils and use them as subbase foundation material for a cap at the Parcel E landfill totals about $15.6 million. The estimated cost presented in the Parcel B feasibility study to excavate and transport the soils to an off-site facility for treatment (as necessary) and disposal totals about $11.2 million. However, the Navy is further evaluating costs in light of recent reductions in the costs for transporting soils off site.

4. **Comment:** **A question was raised about where soil from Parcel B would be stored until it can be placed in the Parcel E landfill.**

Response: Soil excavated from Parcel B will not be placed in the Parcel E landfill; rather, consistent with the selected remedy, it will be transported to off-site treatment and disposal facilities. Storage areas to maintain the excavated soil pending transport will be determined during development of the remedial design for Parcel B. Storage areas that are centrally located and cause minimal impact to HPS tenants will be identified. The storage areas will be designed to prevent runoff and dust migration, in accordance with applicable laws.

5. **Comment:** **One community member asked what areas are designated for landfills in Parcel E.**

Response: Aside from the existing inactive landfill (IR-1/21), there are no designated areas for landfills within Parcel E.

3.1.2 Hazards Associated with Fishing

6. **Comment:** **Many community members raised concerns that deformed fish were found off the coast of HPS. These community members asked if the Navy has investigated whether contaminants from HPS were impacting the fisheries in San Francisco Bay and requested that the Navy prohibit fishing off shipyard property.**

Response: The Navy and the regulators are not aware of any incidences of deformed fish found near HPS. The Navy is conducting an ecological risk assessment to assess potential risks to birds and marine life in the offshore area from exposure to contaminants present at HPS. However, the ecological risk assessment will not include an evaluation of fish that swim offshore of the shipyard because fish migrate throughout the San Francisco Bay and may be impacted by many different industries around the Bay. As many of the industrial operations around the Bay involve similar types of chemicals, the Navy would be unable to directly correlate impacts on the fish to contaminants at HPS. The ecological risk assessment instead focuses on identifying potential sources of contamination within the shipyard to the Bay and determining the possible impact on receptors, such as shellfish, that continually live in the offshore area. By addressing the on-site sources of contamination and minimizing the impact on the offshore receptors, contamination from HPS that may impact fish swimming offshore should also be minimized.

Additionally, a group of ecological assessment specialists from the San Francisco Bay Area regulatory agencies are currently evaluating how to address impacts to fish and marine life within the Bay on a region-wide basis.

It is important to note that the Navy prohibits fishing from HPS. To further discourage fishing off the shore, the Navy has posted signs facing the Bay in four languages (Spanish, Chinese, Vietnamese, and English) in about 50 locations along the shoreline within HPS. The City of San Francisco has also posted signs along the waterfront in 14 locations, extending from Fort Point beneath the Golden Gate Bridge to Candlestick Park, to warn people against eating fish caught in San Francisco Bay.

3.1.3 Contracting Procedures

7. *Comment:* **One community member asked about contracting procedures for developing the remedial design and whether the Navy plans to include minority environmental companies.**

Response: The remedial design will be developed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract, the Navy's primary cleanup contract. The CLEAN contract includes goals to contract 35 percent of its work to small business concerns, of which 20 percent is to be subcontracted to small disadvantaged businesses (SDB). Additionally, the Navy continues to seek local and minority-owned businesses to participate in the environmental cleanup program at HPS. Toward that end, the Navy has hired Business Development Inc. (BDI), a local SDB firm that specializes in Hunters Point development and job opportunities. BDI works closely with the Navy and the Navy's contractor to identify local businesses to participate in the cleanup process.

3.1.4 Transport of Wastes Off-Site

8. **Comment:** **One questioner asked for clarification on the advantages of treating the soil on site compared to excavating and transporting the soil to an off-site certified disposal facility, particularly with regard to long-term effectiveness.**

Response: Based on the Navy's initial evaluation of soil cleanup alternatives, on-site treatment seemed to be the preferable option for several reasons. On-site treatment would permanently reduce the toxicity, mobility, and volume of contaminants contained in the soils (consistent with the U.S. Environmental Protection Agency's [EPA] nine criteria against which alternatives must be evaluated); cause less disruption to the community associated with trucks transporting wastes off-site; and would not add to a growing national problem of limited landfill capacity. Furthermore, regulatory agencies have expressed a preference for on-site treatment. A detailed discussion of how this alternative meets each of EPA's nine criteria is presented on pages 32 and 33 of the Parcel B proposed plan.

Cost comparisons of cleanup alternatives for Parcel B have been reevaluated because of recent reductions in costs for transporting Parcel B wastes to off-site treatment and disposal facilities. In light of the new cost information as well as community concerns expressed during the comment period, the Navy has selected off-site treatment and disposal as the cleanup remedy for Parcel B.

Advantages associated with transporting the soil to off-site treatment and disposal facilities are highlighted on page 25 of the proposed plan: the selected remedy meets EPA's nine criteria, costs less than the other cleanup alternatives, provides more protection to on-site workers, and is responsive to community concerns regarding onsite treatment and disposal.

9. **Comment:** **One community member asked how many trucks will be transporting wastes through the Hunter's Point community and noted a preference for transporting wastes off site by rail or barge rather than trucks.**

Response: It is anticipated that a total of about 36,600 cubic yards of soil will be excavated from Parcel B and transported to off-site treatment and disposal facilities. Given that an average truckload carries about 15 cubic yards, it is estimated that a total of about 2,400 truckloads will be necessary. The Navy is currently exploring options for transporting the soil by rail or barge rather than by truck.

3.1.5 Noise

10. **Comment:** **One community member raised concern about noise associated with cleanup equipment; this member asked about the specific time period such equipment will be used and the noise level that can be expected.**

Response: The equipment used to excavate soils from Parcel B (consistent with the selected remedy) will include backhoes. The soils will be shipped by truck or rail to off-site treatment and disposal facilities. Anticipated noise levels will be comparable to a construction site at which a building foundation is being excavated. The cleanup operations will occur during the daylight hours, Monday through Friday, over a 3- to 6-month period. The cleanup operations are expected to start in the Spring 1998. The specific schedules for construction will be detailed in the remedial action work plan.

3.1.6 Public Comment and the Decision-Making Process on the Proposed Plan for Parcel B

11. **Comment:** **A request was made for a 30-day comment period extension on the proposed plan for Parcel B to allow the community the opportunity to prepare meaningful comments on the Parcel B proposed plan.**

Response: The Navy extended the public comment period by 30 days, to December 26, 1996.

12. **Comment:** **One community member asked what happens when the record of decision is published.**

Response: The record of decision presents the final cleanup plan for Parcel B that was selected in light of public comments on the proposed cleanup plan and other National Contingency Plan criteria. A responsiveness summary that addresses public comments on the proposed cleanup plan is included with the record of decision. Once the ROD is signed, the Navy will publish a notice of availability in the local newspapers and will begin designing the cleanup remedy.

13. **Comment:** **One community member asked who would make the final decision about the cleanup remedy.**

Response: The Navy, in partnership with the EPA and the State of California Department of Toxic Substance Control, makes the final decision on the cleanup remedy.

3.1.7 Effectiveness of Thermal Desorption and Solidification and Stabilization Treatment Technologies

14. **Comment:** **One individual expressed support for on-site treatment versus off-site disposal. This same individual questioned whether the numbers used in the Parcel B feasibility study to calculate costs for use of thermal desorption were based on low temperature thermal desorption, asserting that high temperatures will be necessary at Parcel B. As a result, the costs of using thermal desorption are underestimated in the Parcel B feasibility study.**

Response: The Navy believes its cost estimates for using thermal desorption are accurate. Cost calculations were based on high temperature application of thermal desorption. The estimates are based on costs associated with previous thermal desorption applications in environmental conditions similar to those at Parcel B and involved heavy hydrocarbon contamination and high temperatures. EPA guidance requires that cost estimates for proposed cleanup remedy presented in the feasibility study are within a range of 30 percent less and 50 percent more than the actual cost of a given remedy. EPA's guidance allows such a range in cost estimates to address cost uncertainties associated with use of innovative cleanup technologies.

Furthermore, it is important to note that if thermal desorption treatment was included in the selected remedy for Parcel B, the vendor implementing the treatment would have to achieve specified cleanup levels before receiving payment. Nevertheless, the final remedy selected for Parcel B does not include thermal desorption treatment.

15. **Comment:** **A question was raised about why thermal desorption is considered an effective alternative at Parcel B when it has been rejected for Parcel D.**

Response: The final cleanup remedy for Parcel D has not yet been selected. Treatment of the soil through thermal desorption is not included in the selected remedy for Parcel B. The types and concentrations of contaminants at Parcels B and D are different. Different thermal desorption systems have been developed to treat different types of contaminants under different environmental conditions. For example, some thermal desorption systems have been developed to treat lighter

hydrocarbons, such as gasoline present within Parcel D; such treatment would require lower temperatures than those systems designed to treat heavy hydrocarbons such as the polyaromatic hydrocarbons (PAH) and semi-volatile organic compounds (SVOC) present in Parcel B. For example, lower temperatures necessary to treat Parcel D wastes would range from 500° to 800° (F) and high temperatures up to 1,400° (F) would be necessary for Parcel B wastes; therefore, there is no direct comparison between using thermal desorption at Parcel B and Parcel D. Furthermore, any technology selected will be subject to performance pilot tests to ensure that the technology will achieve the cleanup goals.

Comments regarding remediation of Parcel D will be considered during the public comment period on the proposed cleanup plan for Parcel D, expected to be submitted to the public in May 1997.

16. **Comment:** **The proposed plan should present performance data on thermal desorption and solidification and stabilization treatment technologies that indicate their effectiveness relative to the cleanup levels selected for Parcel B.**

Response: As the proposed plan is designed for the general public, it does not provide detailed information such as performance data. Rather, consistent with EPA and state guidance, the proposed plan describes each proposed cleanup alternative and whether and how they satisfy EPA's nine evaluation criteria. Performance data on thermal desorption and solidification and stabilization treatment technologies are presented in the feasibility study on pages 3 to 31 and 5 to 42 (thermal desorption) and 3 to 28 and 5 to 59 (solidification and stabilization). The feasibility study was presented to the HPS RAB and copies were made available to the RAB as well as placed in the HPS public information repositories.

3.1.8 Potential Health Effects

17. **Comment:** **One community member asked what assurances exist to prohibit use of groundwater for drinking, growing vegetables, or private consumption and who will monitor and enforce such prohibitions.**

Response: The Navy currently restricts use of the groundwater for any purpose and prohibits any wells from being drilled within HPS. As part of the groundwater remedy, the deed of transfer will include restrictions on use of the groundwater. The State will be responsible for enforcing those restrictions.

18. **Comment:** **One individual asked how groundwater vapors will be contained to prevent exposure to humans or animals.**

Response: The only area where potential volatilization from groundwater could occur and produce vapors that pose a risk to human health is the groundwater beneath the machine shop within IR-25 which is contaminated with solvents. The Navy and regulators are still discussing how to address groundwater issues at IR-25. To allow more time to develop the most effective means to address these

groundwater issues without slowing the cleanup and eventual reuse of Parcel B, the Navy and the regulators decided to transfer IR-25 from Parcel B to Parcel C. Groundwater contamination and any associated soil contamination beneath IR-25 will be addressed as part of the proposed plan to cleanup Parcel C.

3.1.9 Miscellaneous Questions

19. **Comment:** **A question was raised about whether the soil will be treated at a depth of 10 feet below the surface and whether that that depth reaches the groundwater table.**

Response: Sites IR-7 (the subbase area) and IR-18 (waste disposal area) were the only areas within Parcel B where contaminants were detected below 10 feet; therefore, soil will be excavated at those two sites down to the groundwater table to prevent contaminants from migrating into the groundwater.

20. **Comment:** **One individual asked why soils from Parcel B needed to be taken to hazardous waste facility if they are treated and cleaned.**

Response: Approximately 20 percent of the soils excavated from Parcel B will be sent directly to a treatment and disposal facility that handles strictly hazardous waste. The remaining 80 percent of soils from Parcel B will include some clean soils as well as some soils that are less hazardous but still require some treatment. Under the selected cleanup plan, soils will be excavated and sent to off-site treatment and disposal facilities where they will be toxicity tested and treated and disposed of according to federal and state requirements.

21. **Comment:** **A question was raised about whether any machinery can be salvaged from Parcel B for industrial use.**

Response: All unusable machinery has been transported from HPS for salvage or reuse.

22. **Comment:** **A question was raised about who will monitor the construction crews when the land is developed for future use.**

Response: Any future reuse of HPS property will be the responsibility of the San Francisco Redevelopment Agency. Contaminated soils will be removed by the time the property is developed for future use. Potential risks associated with the groundwater will be addressed by including restrictions on groundwater use in the deed of transfer. As necessary, the Redevelopment Agency will require construction workers to take protective measures to prevent risks to on-site workers and tenants near the area of construction.

23. **Comment:** **A question was raised regarding the cost to cleanup Parcel B and who will pay for the cleanup.**

Response: The cost of the selected cleanup remedy totals about $14.8 million: $11.2 million is for the soil remedy, and $3.6 is for the groundwater remedy. The Navy will pay for the cleanup, as required by CERCLA.

3.2 COMMENTS FROM CITY AND COUNTY OF SAN FRANCISCO, DEPARTMENT OF PUBLIC HEALTH, BUREAU OF ENVIRONMENTAL HEALTH MANAGEMENT

1. **Comment:** **As part of the remediation of groundwater, the Navy has stated that it will line portions of the storm water pipes. Our concern is that this effort should be coordinated with the San Francisco Redevelopment Agency and its plans to replace any if not all of the utilities at the shipyard. If replacing the pipes can provide the same level of environmental protection as lining the pipes then taxpayer's money will not have to be spent twice on lining the pipes and then later replacing them.**

   Response: The Navy does not plan on replacing any utilities; rather, as necessary, the Navy will repair existing utilities to prevent migration of contaminants from the site to the Bay. Utilities could not be replaced until the City's redevelopment plans are certain. Definitive redevelopment plans cannot be made until adequate funding is generated through new businesses located at HPS. As it is still unclear when such funds would be available, the Navy plans to move forward in the meantime and repair the utilities, to expedite transfer of HPS.

2. **Comment:** **The Navy should manage the treated soil so it is consistent with the reuse of the landfill (IR Site 1/21) at Parcel E or wherever the treated soil will ultimately be placed. Although the Health Department does realize that restrictions may be placed on Parcel E, we want to ensure that future disposal actions at the landfill are not the cause of additional and burdensome restrictions.**

   Response: The Navy's initial proposed cleanup plan for Parcel B involved using treated soils from Parcel B as subbase foundation material for the Parcel E landfill cap. The Navy's selected remedy does not include any use of the Parcel E landfill; instead, soils will be shipped to an off-site landfill.

3. **Comment:** **The remediation includes groundwater monitoring which will require tracking of monitoring wells for 30 years. The Department of Health would like the Navy to have in place a plan to manage the tracking of these wells and to be notified of who within the Navy is responsible for the tracking of these wells so they are not "lost" or "damaged" during future construction and reuse of the parcel.**

   Response: When the Navy transfers HPS to the City, documentation will be provided to identify the location of all wells installed during the remedial investigation and feasibility study, as well as during the remedial action. As part of the transfer of property, the Navy and the City will address how to handle future monitoring of the wells. The Navy plans to monitor the groundwater for 30 years following completion of the remedial action.

3.3 COMMENTS FROM THE COALITION FOR BETTER WASTEWATER SOLUTIONS

1. **Comment:** **Much of the Navy's preferred alternative for toxic soils in Parcel B is based on treating the contaminated soil and leaving it on-site to cap a landfill that is already a toxic site within the Hunters Point Naval Base. Yet, the proposed plan doesn't address the long-term impacts of this very critical policy of maintaining a toxic site on the base. It would seem that a much more thorough study of capping of this toxic landfill needs to be conducted regarding the impacts on groundwater, the impacts on the Bay's surface water in the event of normal subsurface migration, or in the event of liquefaction during a seismic event, the impacts on humans in adjacent land-uses, including the Golden Gate Railroad Museum where increasing amounts of children and adults circulate, and the impacts on residents nearby who would be exposed if somehow toxic groundwater backed up into their neighborhoods as a result of capping and sealing off of the current access of polluted water into the Bay.**

   Response: The Navy's initial proposed cleanup plan for Parcel B involved using clean and treated soils from Parcel B as subbase foundation material for the Parcel E landfill cap. The treated soils would have been cleaned to a level protective of San Francisco Bay. The initial proposed plan was consistent with EPA's guidance on landfill "presumptive remedies." EPA's presumptive remedy for landfills involves capping and containment of the groundwater. The initial proposed plan was not designed to increase the size of the Parcel E landfill; rather, only clean and treated soils would have been used to provide subbase foundation material for the Parcel E landfill. With respect to contaminated groundwater leaching from the landfill, the Navy is currently conducting an action to install an underground sheet piling wall to contain the groundwater and prevent grounndwater from seeping in or out of the contained area. This action is also consistent with EPA's presumptive remedy for landfills.

   In light of community concerns and recent reduction in costs associated with transporting the wastes to off-site facilities, however, the Navy has reevaluated the soil cleanup alternatives and selected a remedy that does not include any use of the Parcel E landfill. Soils will instead be shipped to off-site treatment and disposal facilities. Concerns about how to address the Parcel E landfill, including geotechnical concerns and exposure scenarios, will be evaluated during the feasibility study for Parcel E.

   Public comments regarding measures to remediate the Parcel E landfill will be considered during the public comment period on the proposed plan for Parcel E and addressed in the responsiveness summary that will be part of the record of decision for Parcel E. The proposed plan for Parcel E is expected to be completed and made available to the public for comment December 1997.

2. **Comment:** **Why doesn't the proposed plan more thoroughly address the long-term impacts of capping and leaving in place the toxic material in the landfill at IR-1/21?**

Response: The proposed plan for Parcel B focuses only on options to clean up Parcel B; it does not address possible cleanup options for other parcels within HPS, such as Parcel E. The Parcel E landfill was discussed in the Parcel B proposed plan only as part of an option for handling Parcel B soils. As the proposed plan explains, before such an alternative can be implemented, the Navy would have thoroughly evaluated the long-term impacts from the Parcel E landfill. Use of the Parcel E landfill is no longer part of the selected remedy for Parcel B, however, and comments regarding the landfill will be considered during the public comment period on the proposed plan for Parcel E.

3. **Comment:** **Although you may "cap" the top of the landfill and even dam off the access of groundwater to the Bay, how do you prevent the rising and falling water table below the toxic site from constantly "bathing" the landfill's toxic waste in water and creating even more toxic leachate from the soluble contaminants already in the capped landfill? In essence, can you really prevent the continued long-term pollution of groundwater and surface waters from such a low-lying toxic site? Doesn't this really necessitate an upland disposal solution?**

Response: As noted in the response to comment 1, an underground sheet piling wall is being installed to prevent the movement of groundwater from beneath the landfill and to prevent infiltration of groundwater into the landfill. Options for addressing the Parcel E will be evaluated in the Parcel E feasibility study and will include consideration of hydrogeological and geotechnical concerns.

4. **Comment:** **Why isn't the Navy looking at eliminating the toxic landfill from Hunter's Point altogether? Isn't it a waste of taxpayer's money and a missed opportunity when you don't try to truly "clean" this site, but rather move toxic wastes from one part of the Hunters Point site to another in kind of a "pollution shell game?"**

Response: These comments refer to measures to remediate the Parcel E landfill. The Navy will consider this comment as it evaluates alternatives to address the landfill. Because of the complexities of moving landfills as well as EPA's presumptive remedy for landfills (see the response to comment 1), the Navy initially concluded that a cap may be appropriate for the Parcel E landfill. The Navy will evaluate capping as just one alternative among other cleanup alternatives in the Parcel E feasibility study. The public will have the opportunity to comment on cleanup alternatives for Parcel E when the Parcel E proposed plan is completed in December 1997.

5. **Comment:** **Has the Navy and its consultants considered or economically evaluated the clean-up of the existing toxic site and the conversion of it to a wetland which could forever improve the water quality and environment of San Francisco Bay? Is there a "deep-pocket" generator(s) besides the Navy, who used the toxic landfill in the past and could be a principal responsible party for its clean-up? If so, shouldn't the Navy pursue a cost-sharing from the responsible party so that this toxic site is not left sitting along the Bay for future generations?**

Response: These comments refer to measures to remediate the Parcel E landfill and will be considered during the public comment period on the proposed plan for Parcel E. As the cleanup process continues, the Navy will evaluate the liability of other potentially responsible parties.

6. **Comment:** **The proposed plan recommends spending almost $22 million on the preferred alternatives, but there doesn't seem to be a commensurate environmental improvement from that expenditure. Instead, treated contaminated soils are still left on-site above a toxic waste site that is proposed to remain along the Bay and be monitored by high-priced consultants for 30 years or more. Although some groundwater will be pumped and cleaned, the groundwater under the toxic waste site will continue to "bathe" the toxins and created more polluted groundwater.**

Response: The initial proposed cleanup plan for Parcel B would have involved the use of only clean and treated soils for subbase foundation material for the Parcel E landfill; the initial proposed cleanup plan was not designed to increase the size of the Parcel E landfill. As noted above, before the initial Parcel B proposed plan could have been implemented, the Navy would have thoroughly evaluated the long-term impacts from the Parcel E landfill and alternatives for addressing the landfill. As noted in the response to comment 1, the selected remedy no longer includes use of the Parcel E landfill, and steps are underway to contain groundwater migration around the landfill.

7. **Comment:** **What do you really gain by a proposed plan that keeps all these toxics remaining on the Hunters Point site? What would be the price to remove them to an upland facility that is away from population centers and is designed with a geology, hydrology, climate and other factors that make it much more appropriate than adjacent to the Bay? Can it really be that much more expensive than $22 million and wouldn't the benefits far outweigh the costs? Can it be done safely without trucks running through the neighborhoods?**

Response: See the response to comment 1; the selected remedy no longer includes use of the Parcel E landfill. Issues such as costs associated with shipping landfill wastes to off-site disposal facilities will be addressed in the Parcel E feasibility study.

8. **Comment:** **If a solution for removal from the site and upland disposal away from Hunters Point residents is no more expensive than the preferred alternative of on-site disposal, what rational does the Navy have (besides prolong high-priced consultant contracts) for not accepting that as a superior alternative?**

Response: The initial proposed plan for Parcel B soils included on-site treatment and disposal; however, the selected remedy no longer involves on-site treatment and disposal: it includes shipment of Parcel B soils to off-site certified disposal facilities. The estimate for the soil remedy is approximately $11.2 million.

3.4 COMMENTS FROM THE INNES AVENUE COALITION

1. **Comment:** **The proposed alternative establishes that some of the cleaned soil from Parcel B will be used to "cap" contaminated soil on Parcel E. However, this assumes decisions concerning Parcel E (that the contaminated soil can be capped successfully), which, to the best of my knowledge, have not been made. Does approval of this plan give tacit approval to leaving contaminated soil in Parcel E?**

   Response: No. The preferred alternative for soil presented in the Parcel B proposed plan would have been contingent on the final cleanup remedy selected for the Parcel E landfill. The final cleanup remedy for Parcel E cannot be selected until the public has the opportunity to comment on all cleanup alternatives considered for the Parcel E landfill. Following public comment, the Navy, in consultation with the regulatory agencies, will determine the best alternative for the Parcel E landfill.

2. **Comment:** **While the proposed alternative provides the "solution" of using the cleaned soil as a cap, it says nothing about the timeline for these procedures. What will be done with the "clean" soil while it is waiting to be used on Parcel E?**

   Response: The preferred alternative initially proposed for Parcel B would have involved storing the treated soil on site until a final remedy is selected for Parcel E. The storage location would have been determined during development of the remedial design.

3. **Comment:** **The proposed alternative uses technology that cleans much of the contaminated soil on site but it says nothing about the parameters of the work involved. What is the noise level of the machinery involved? Will the work be done according to San Francisco City and County construction ordinances for sound and safety so close to a residential neighborhood?**

   Response: The selected remedy does not include on-site treatment; instead, soils will be excavated and transported by either truck or rail to permitted off-site treatment and disposal facilities. The equipment used to excavate and transport soils from Parcel B will include backhoes. Anticipated noise levels will be comparable to a construction site at which a building foundation is being excavated. The cleanup operations will occur during the daylight hours, Monday through Friday, over a 3- to 6- month period. The cleanup operations are expected to start in the Spring 1998. Construction work will be conducted in accordance with applicable city and county construction ordinances.

4. **Comment:** **The proposed alternative states that a great deal of both contaminated and cleaned soil will be hauled away and additional clean soil will be brought in to fill holes, all by truck. My estimates are that more than 10,000 truck round trips will be needed to haul all of this soil to and from the HPS during the course of all cleanup. Considering that the only access to the HPS is one residential street (Innes Avenue), why haven't alternative transportation methods be considered? Furthermore, all transportation**

experts state that trucking is the most expensive hauling method. There is a railhead at the HPS, rail is less expensive than trucking, is rail being considered? The HPS is on the bay, is barge being considered?

Response: It is anticipated that a total of about 36,600 cubic yards of soil will be excavated from Parcel B and transported to off-site treatment and disposal facilities. Given that an average truckload carries about 15 cubic yards, it is estimated that a total of about 2,400 truckloads will be necessary to remove the soil. Approximately the same amount of clean fill will be used to backfill the excavated area. The Navy is currently exploring options for transporting the soil by rail and barge rather than by truck to avoid transporting the soils through the Bayview community.

5. **Comment:** **The proposed alternative provides no information concerning proper compensation or even notification for the current HPS tenants or the adjacent neighborhood during rehabilitation. What plans are being made for notification and compensation to shipyard tenants and to residents and businesses on Innes Avenue during this work?**

Response: Steps will be taken to minimize the noise and impact to HPS tenants and nearby residents and businesses. For example, operating hours will be restricted to regular work hours and dust suppression steps will be taken. Additionally, tenants will be notified of planned actions and any associated precautionary measures that may be necessary. As previously noted, the Navy is currently evaluating options to transport Parcel B soils by rail rather than truck to avoid hauling the soils through the Bayview community. Shipyard tenants and residents living adjacent to HPS will be notified before on-site construction begins.

3.5 COMMENTS FROM ARC ECOLOGY

Use of the Parcel E Landfill

1. **Comment:** **It's too early to presume availability of the Parcel E Landfill.**

The preferred alternative assumes that soils treated by thermal desorption and/or soil solidification/stabilization will form the foundation layer for a cap at the Parcel E landfill. Arc Ecology believes that the Navy owes it to the surrounding community to do a much more thorough analysis of the consequences of retaining the landfill on Parcel E before any plans are made to deposit more material upon it.

If the Navy wishes to include the Parcel E landfill in proposed remedies for other parcels, we ask that the Navy prepare and circulate a site-specific RI/FS/Proposed Plan/ROD. Until this is done, or until the landfill issues are resolved during existing Parcel E CERCLA process, we oppose placement of new material at this site. Furthermore, we oppose stockpiling large quantities of soil for an extended period, in anticipation of the Parcel E

landfill being capped. If the Navy chooses to stockpile soils as part of the Parcel B remedy, then the potential consequences to the community and the ecosystem must be thoroughly evaluated.

Response: The Navy did not intend to place any soil on the Parcel E landfill until cleanup alternatives for the landfill had been fully evaluated and the public had a chance to comment on those alternatives. Treated soil would only be placed on the landfill if the final selected remedy involved capping the landfill. Any stockpiling of soil would have included measures to protect on-site workers and tenants as well as the environment. The soils would have been treated to cleanup levels protective of San Francisco Bay, and the storage areas would be contained to prevent runoff and dust migration in accordance with applicable laws.

The Navy's selected remedy no longer includes any use of the Parcel E landfill; instead, soils will be shipped to off-site treatment and disposal facilities. Comments regarding measures to remediate the Parcel E landfill will be considered during the public comment period on the proposed plan and addressed in the responsiveness summary included as part of the record of decision. The proposed plan for Parcel E is expected to be completed and submitted to the public for comment December 1997.

Excavation

2. **Comment:** **VOC control during excavation needs more evaluation or explanation.**

The Proposed Plan states that alternative S-6 would involve excavating soils for which emissions of VOCs may be difficult to control. Please elaborate. How would VOCs be controlled during excavation? What additional costs might be associated with VOC control during excavation? Could volatilization of SVOCs, including PCBs, also be an issue? Why or why not?

Response: The Proposed Plan does not state that alternative S-6 would involve excavating soils for which emissions of VOCs may be difficult to control. It is very unlikely that VOC emissions at hazardous levels will occur during excavation of Parcel B soil. However, to be protective, air monitoring equipment will monitor the levels of VOCs (if any) at the excavation locations and at the perimeter of IR site boundaries where excavation has occurred during the excavation. In the unlikely event hazardous VOC emissions are detected during excavation, control actions will be taken to protect workers, tenants, and the community. SVOCs and PCB volatilization during excavation should not be an issue because excavation conditions, such as ambient temperature, are not sufficient to volatilize these contaminants.

3. **Comment:** **Soil dewatering needs to be more thoroughly analyzed.**

Groundwater is encountered at fairly shallow depths on Parcel B. How would soils be dewatered and/or dried prior to treatment? How would potential VOC emissions from drying soil be evaluated and controlled?

How would wastewater be collected, tested, and disposed of? Were costs associated with treatment dewatering included in the cost estimates? What would be the effect on costs and performance if soils are not dried prior to thermal desorption treatment?

Response: Soil would be dewatered on site by air drying; the process may be enhanced by using fans. In the unlikely event high levels of VOC emissions occur, the emissions can be controlled by conducting drying within a closed temporary structure or building. Individual excavations will be dewatered by pumping. Collected water will be placed in a tank, sampled, and discharged to an appropriate treatment facility, if necessary. As discussed on page 5-43 of the Draft Final Parcel B Feasibility Study, if soils are not dried prior to thermal desorption treatment, additional fuel costs will be incurred to dry the soil.

Proposed Treatment

4. **Comment:** **Leachability tests for stabilized soils need more explanation.**

Will the Navy mix soils from many sources prior to collecting samples for leachability tests? How large will the stockpiles be from which samples are drawn? Are there regulatory guidelines as to how many samples must be taken from the stabilization process and how they must be analyzed? What kind of analysis will be used to ensure long-term stability of treated soils?

Response: Stabilization is a technology by which soil and additives are mixed to bind contaminants within a cement-like product. Soil from different locations would be mixed as part of the stabilization process. Soils would be stockpiled according to the types of contaminants they contain and then subject to a performance pilot test to ensure the stabilization technology achieves the cleanup goals. Samples for leachability testing would likely be collected based on the volume of treated material generated, rather than the number of stockpiles created.

Soil stabilization is no longer included in the selected remedy; instead the selected remedy includes excavating the soils and transporting them to an off-site facility for treatment and disposal.

5. **Comment:** **Costs and consequences associated with off-site disposal of solidified soils should be presented.**

How much more would it cost if stabilized soils must be disposed of at an off-site landfill? It seems to me that costs of off-site disposal of stabilized soil could be very high, perhaps an additional half- to one million dollars. (Estimate calculated by: 25063 cy * 1.3 bulking factor /17.4 cy/truck) * 310.75 $/truckload = $581,887 + $50,000 for disposal fees). How would these soils be moved off-site?

Response: As noted, soil stabilization is no longer included in the selected remedy. The total estimated cost to excavate and transport Parcel B soils to an off-site facility

for treatment and disposal is about $11.2 million. The Navy is currently evaluating options to transport the soils off site via truck, rail, or barge.

6. **Comment:** **Thermal desorption technology is oversold.**

What level of effectiveness can be achieved by the proposed thermal desorption technology for Parcel B chemicals of concern, particularly for PCBs? The EPA SITE data we've seen shows much higher residual levels for PCBs than Hunters Point target cleanup levels for Parcel B. This implies that treated soils anticipated to be disposed of at the Parcel E landfill will be contaminated above Parcel B target cleanup levels. Furthermore, we understand that treatment of the "fines" in thermal desorption units can be a problem, even when they are run back through the treatment unit. Please provide more information about typical problems encountered with high-temperature thermal desorption treatment and assess the level of cleanup possible using thermal desorption of Parcel B soils.

What is the contingency plan should treatability studies conclude that thermal desorption will not achieve an appropriate level of cleanup?

What sort of stack gas emissions and fugitive dust emissions are typical of high temperature thermal desorption units? What air emission performance standards would apply? What sort of technologies would be used to control stack emissions?

Treating PCBs by thermal desorption requires high operating temperatures, in the range of 1200 degrees Fahrenheit. This temperature is above the boiling points for arsenic, mercury, and thallium. How effectively can these volatilized metals be removed from stack gasses.

Response: The initial proposed cleanup plan for Parcel B included soil treatment through thermal desorption, coupled with. The selected remedy for Parcel B does not include use of thermal desorption or solidification and stabilization, nor does the selected remedy involve the use of the Parcel E landfill. Instead, soils will be shipped to off-site treatment and disposal facilities.

Environmental conditions at Superfund Innovative Technology Evaluation (SITE) demonstration locations are not necessarily the same as Parcel B conditions. The initial proposed plan called for using treated soils from Parcel B as subbase foundation material for the Parcel E landfill. The treated Parcel B soils would have to meet the IR-1/21 placement criteria of protection of the San Francisco Bay. Furthermore, it is important to note that if thermal desorption treatment was included in the selected remedy for Parcel B, the vendor implementing the treatment would have had to achieve specified cleanup levels before receiving payment.

Thermal desorption would be used to treat soils containing VOCs and combined VOCs and inorganics. If thermal desorption-treated soil, including fines, does

not meet cleanup criteria, it will either be transported off site for disposal or further treated by solidification and stabilization.

The vendor implementing the thermal desorption treatment would be made aware of the soil contaminants and the emission requirements for such contaminants. The vendor would be required to prove that compliance with required regulations is achievable.

7. **Comment:** **The costs estimated for thermal desorption treatment seem low.**

The cost estimate for the preferred alternative seems low. The Feasibility Study states that high temperature thermal desorption must be used to treat the SVOCs. Yet, the cost estimate worksheets in Appendix E of the *Feasibility Study* use *$91/ton to estimate costs for low-temperature thermal* desorption. According to EPA's SITE documents, the cost of a high-temperature unit ranges from $100 to $400 per ton of soil with the high end being typical of units treating PCBs. Using these unit cost factors would increase the cost of cleanup by $159,000 to $3,687,000.

How would the Navy respond if costs associated with the preferred alternative were overrun by a significant amount over the contingency? How would costs of off-site disposal be covered if it became necessary some time during the remediation effort?

Response: As noted in the response to comment 6, environmental conditions at SITE demonstration locations are not necessarily the same conditions as Parcel B conditions. The Navy believes its cost estimates for using thermal desorption are accurate. The Navy's cost estimates are based on discussions with various thermal desorption vendors who were made aware of the Parcel B soil contaminants. EPA guidance requires that cost estimates for proposed cleanup remedy presented in the feasibility study are within a range of 30 percent less and 50 percent more than the actual cost of a given remedy. EPA's guidance allows such a range in cost estimates to address cost uncertainties associated with use of innovative cleanup technologies.

Nevertheless, the remedy selected for Parcel B does not include thermal desorption treatment.

8. **Comment:** **Overall, we support remedial actions at Hunters Point Shipyard that help to restore the area to the condition in which the Navy found it. Our preference is for remedial actions that do not require the Navy to carry out long-term maintenance and monitoring at the Shipyard. Not only does this strategy assure the community that the site, and the surrounding ecosystem, will remain safe, but it also allows the City flexibility in planning reuses that benefit and enhance the neighboring community.**

Response: The Navy also supports remedial actions that restore the area to beneficial use as well as require minimal long-term maintenance and monitoring. Remedial actions selected for each site within HPS will depend on the nature and extent of contamination as well as appropriate remedial technologies currently available.

3.6 COMMENTS FROM LESLIE KATZ, BOARD OF SUPERVISORS, CITY AND COUNTY OF SAN FRANCISCO

1. **Comment:** **From what I understand, the landfill that the Navy plans on using is already a toxic site within the Hunters Point Naval Base. Since the Naval Base is in a major City, and the City is hoping to use this land to enhance the neighboring communities, it does not appear to make sense to maintain a toxic site on the Base. It seems to me that a much more thorough study of capping this toxic landfill needs to be conducted before a decision is made. This is especially of concern regarding impacts on groundwater, the Bay Area's surface water, and humans in the adjacent area.**

   Response: The Navy's initial proposed cleanup plan for Parcel B involved using treated soils from Parcel B as subbase foundation material for the Parcel E landfill cap. In light of recent reductions in costs associated with transporting Parcel B wastes to off-site facilities, as well as community concerns, the Navy's selected remedy no longer includes any use of the Parcel E landfill; instead, soils will be shipped to off-site treatment and disposal facilities. The ultimate decision on how to address the Parcel E landfill will be evaluated in the Parcel E feasibility study. The proposed plan for Parcel E will include cleanup options for Parcel E and will be made available to the public for comment in December 1997.

2. **Comment:** **Although the proposed plan recommends spending $22 million on the preferred alternatives, there does not appear to be a commensurate environmental improvement from that expenditure. I am concerned that the treated contaminated soils are still left onsite above a toxic waste site that is proposed to remain along the Bay for at least 30 years. In addition, I question why the Navy would want to keep all these toxins remaining on the Hunters Point site. It would seem wiser to remove these toxins and place them in a facility that is away from the population centers .**

   Response: The Parcel E landfill is no longer included in the selected remedy for Parcel B. Comments and concerns related to the Parcel E landfill will be considered during the public comment period on the proposed plan for Parcel E, which is expected to be made available to the public in December 1997.

3.7 COMMENTS FROM ECDC ENVIRONMENTAL

1. **Comment:** **ECDC Environmental has assumed responsibility for the rail transport and disposal of tens of thousands of tons of contaminated dredge spoils from a major Superfund project in the Richmond Harbor. The United Heckathorn Superfund Project resulted from years of DDT and DDE discharges from a pesticide manufacturing plant along the Richmond Harbor and docks. The scope of the project consisted of the dredging, treatment, rail transport and upland disposal of approximately 100,000 cubic yards of contaminated marine sediments from two channels in the Richmond Harbor. The bids for contractors to perform all of that work came in around $8 million. That cost included everything except EPA's costs of preparing documents and**

providing project management oversight throughout the Superfund process.

This recent Bay Area example of a remediation project event more complex than the Hunters Point project is important because it provides a basis for comparison of how much clean-up work can actually be accomplished at Hunters Point for a cost substantially less than initial analyses had portended. This suggests that, not only could the Parcel B contaminated material be economically and environmentally rail transported off-base, but that, looking forward to Parcel E, it may be economically feasible to entirely eliminate the toxic landfill at Hunters Point and make a meaningful environmental contribution to the long-term future of the Bay Area. This would truly fulfill the mission of the Navy for "restoration" of the property.

ECDC along with a local Hunters Point minority partner are fully capable and willing to perform the services required to restore the Hunters Point property to an environmentally sound condition, and to do so at a cost considerably lower than that proposed by use of the "Preferred Alternative," as recommended in the October 15, 1996, Draft Final Parcel B Proposed Plan - Hunters Point Shipyard.

Response: The selected alternative for Parcel B has changed from the preferred alternative presented in the Parcel B proposed plan. The Navy's selected remedy for Parcel B will involve excavating and transporting Parcel B contaminated soils to an off-site facility for treatment (as necessary) and disposal. The ECDC Environmental disposal facility in East Carbondale, Utah is being considered as part of the selected remedy. The Navy is currently evaluating options for transporting Parcel B soils by either rail, truck, or barge.

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